Wells G+H
223120

RD/RA Year 7 Annual Report For The UniFirst Site

Remedial Action at the Northeast Quadrant of the Wells G & H Site, Woburn, Massachusetts

Groundwater Extraction, Treatment, Monitoring & Capture System Performance

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Prepared for:
UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Submitted to:
U.S. Environmental Protection Agency
Region I

Prepared by:
AO, Inc.
1304 S.W. 160th Ave, Suite 435
Fort Lauderdale, FL 33326

November 15, 1999

Harvard
Project
Services

Via U.S. Mail

November 12, 1999

Mary Garren
Remedial Project Manager
US EPA – Region I
1 Congress Street
Suite 1100 (HBO)
Boston, MA 02114-2023

Re: Year 7 Annual Report, UniFirst Corporation
Wells G&H Site, Woburn, MA

Dear Ms. Garren:

On behalf of UniFirst Corporation, I am submitting the report "RD/RA Year 7 Annual Report for the UniFirst Site."

Should you have any questions, please call.

Sincerely,

T Cosgrove

Timothy M. Cosgrave
Project Manager

TMC:hs
enclosure

cc: Anna Mayor, BWSC, DEP
Robert Donati, Foster Wheeler
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1 INTRODUCTION

This document is the seventh Annual Report for the UniFirst Remedial Action, prepared pursuant to the Consent Decree (Civil Action No. 91-11807-MA) Statement of Work, Section VIII (B) (5), as further described in the "Operation and Maintenance Plan - the UniFirst Site", dated February 1, 1993, and revised March 1994. This Annual Report describes operation of the groundwater extraction and treatment system during the period of October 1, 1998 to September 30, 1999. In addition, the report summarizes and discusses the results of the water-level measurements and water-quality analyses from wells on the UniFirst property, and west and south of the UniFirst property, used to monitor the effects of pumping from well UC-22 (the recovery system).

AO, Inc. conducted the activities described in this document and is its principal author. All data and field documentation collected during the operation of the system, such as field sheets, sample logs, data files, and laboratory reports, are being maintained in the offices of AO, Inc. and previous contractors responsible for operation of the system (The Johnson Company, ENSR Consulting & Engineering, Inc. and Handex of New England, Inc.).

1.1 Background and Objectives

Treatment System

The purpose of the groundwater extraction and treatment systems installed and operated on the UniFirst and Grace properties is to address the remedial objectives for contaminated groundwater as stated in the Consent Decree:

- Prevent the further introduction of contaminated groundwater from the source areas to the Central Area;
- Limit the further migration of contaminated groundwater off-site from the source areas;
- Restore the bedrock and overburden aquifers in the vicinity of the source areas to drinking water quality; and
- Prevent public contact with contaminated groundwater above the Cleanup Levels.

Based on these objectives, UniFirst and Grace started integrated groundwater pumping and remediation systems on the UniFirst and Grace properties on September 30, 1992. The combined UniFirst/Grace groundwater pumping and remediation program consists of two extraction and treatment systems that work in concert. The recovery system on the Grace property presently consists of 16 wells that pump groundwater from the unconsolidated deposits and upper bedrock. On December 3, 1997 pumping from Grace recovery wells RW1 through RW6 was stopped in

accordance with the EPA approved revised recovery well operation plan. Grace has prepared a separate annual report on the recovery system on the Grace property. That document is entitled *W.R. Grace Remedial Action Wells G&H Site, Woburn, Massachusetts, Annual Report for October 1, 1998 to September 30, 1999* prepared by HSI GeoTrans, Inc., and submitted to the EPA under separate cover on November 15, 1999.

Capture System

The recovery system on the UniFirst property consists of a single well, UC22, which pumped groundwater from the bedrock at approximately 40 gallons per minute (gpm) during the 1999 monitoring period. This well is located at the northeast corner of the UniFirst property. Its total depth is 190 feet below ground surface with an open interval of 175 feet in bedrock. The pump is set at approximately 175 feet below the ground surface.

When UC22 pumping began on September 30, 1992, 91 well points at 35 locations were monitored for water levels quarterly, and seven wells contained data loggers. By February 1995, a total of 116 well points were monitored quarterly for water levels and data loggers were installed in four additional wells. These data were presented on a table, 91 hydrographs, five potentiometric cross sections, and two potentiometric surface maps in quarterly and annual reports for Years 1, 2, and 3.

In August 1996, EPA approved additional modifications to the Long Term Monitoring Program (LTM). These modifications included a shift to annual monitoring of the well network and changes to the number and locations of wells sampled and monitored for water-level elevations. Table 1 presents the current monitoring wells sampled annually each spring, and Table 2 provides a list of wells measured in the spring water-level monitoring program. Table 3 summarizes the depth and screened elevation of the monitoring wells discussed in this report.

Year 7 Modified Activities

The LTM program for the period October 1998 through September 1999 was implemented in compliance with the approved plans.

Report Contents

This report contains the extraction and treatment system and monitoring well data collected during the seventh year of operation of the UniFirst groundwater extraction and treatment system. Section 1.0 provides a general background and objectives with a yearly update of modified activities.

Section 2 of this report evaluates the area of groundwater capture in the bedrock and unconsolidated deposits. Potentiometric maps of the April 1999 water-level measurements are presented in Appendix A. Water-level measurements recorded in 1999 are presented in tables and hydrographs in Appendices B and C.

In addition to the usual five potentiometric cross sections reported for a given water-level measurement event, an additional more detailed potentiometric cross section is presented in Appendix A at two different vertical exaggerations. This additional cross section includes a greater number of monitoring wells for the purpose of illustrating groundwater capture in the unconsolidated deposits at the western boundary of the UniFirst property.

Section 3 describes water quality observations in the VOC data. The 1999 data are presented in Appendix D and a concentration distribution map in Appendix A.

Section 4 evaluates the groundwater extraction and treatment system performance. This section further discusses the water quality for the influent and discharge, groundwater pumping rate, recovery well water level elevations, contaminant mass removal, and the overall performance of the system's components.

Section 5 summarizes the operation and maintenance of the groundwater extraction and treatment system. It includes a discussion of system downtime, energy and chemical usage, and maintenance and repairs conducted during Year 7.

Section 6 includes recommendations regarding the continued monitoring of the system and provides brief conclusions.

Project Team Organization

AO, Inc. has been UniFirst's contractor for operation of the treatment system since October 10, 1998. Harvard Project Services supervises the operations and prepares monthly and annual reports for AO, Inc. The Johnson Company continues to provide technical assistance in the capacity of Design Engineer and Hydrogeology Consultant. Calgon Carbon Corporation, the manufacturer of the Ultraviolet/Chemical Oxidation process unit (UV/Ox unit) provides ongoing maintenance and troubleshooting services for the UV/Ox unit under a separate service contract. B.C. Plumbing & Heating, a plumbing contractor continues to provide, as needed, emergency response and trouble-shooting services.

Katahdin Analytical Services, Westbrook, Maine continued to provide laboratory services for the seventh year of operation. In 1999, AO, Inc. hired HSI GeoTrans, which has worked for Grace and UniFirst in many capacities for many years on the Wells G&H Site, to undertake the water-level measurements and ground water sampling that are part of the Long-Term Monitoring Program. Quality assurance for the project, as set forth in the Quality Assurance and Quality Control Plan, continues to be monitored by ECCI of Windham, Maine.

Environmental Project Control, Inc., Maynard, Massachusetts, is UniFirst's Project Coordinator for Consent Decree-related matters, which includes general oversight of the treatment system operations.

2 GROUNDWATER CAPTURE EVALUATION

2.1 Bedrock

A review of the potentiometric maps and cross sections presented in Appendix A show an extensive vertical and horizontal area of groundwater capture in the bedrock. With the exception of brief periods of treatment and pumping system down time, this capture has been maintained beyond the UniFirst and Grace property boundaries throughout the seven years of operation.

The water-level data table in Appendix B shows that in most monitoring wells, the highest and lowest recorded water-level elevations for the period September 1992 through April 1999 occur in approximately April and November, respectively. The capture area throughout the seventh year of monitoring extends approximately 1,000 feet south of UC22 as shown by water-level elevations measured in UG1 and UC12, and more than 400 feet vertically, as shown by water-level elevations measured in UC23 and well nest UG1. The potentiometric maps and cross sections in Appendix A illustrate the extent of groundwater capture. These maps and cross sections show that groundwater capture extends beyond the UniFirst property boundaries.

One bedrock monitoring well (pumping well UC22) contained a data logger and transducer during the seventh year of monitoring. The hydrograph for this well, presented in Appendix C, shows that in the seventh year the highest groundwater elevations occurred at the beginning of April and the lowest at the beginning of September.

2.2 Unconsolidated Deposits

In addition to the five potentiometric cross sections (Figures 1A through 1E), two additional potentiometric cross sections (Figures 1F and 1G) were prepared to better illustrate capture of all contaminated groundwater flow from the UniFirst property and its western boundary by pumping well UC22. These two cross sections, P-P' at vertical exaggerations of 5:1 and 2.5:1, are presented with an interpretation of the April 1999 water-level data. These two cross sections, and the five-potentiometric cross sections presented, show that all contaminated groundwater flow from the UniFirst property has been captured by the UniFirst groundwater extraction system.

Since the initiation of the extraction and treatment system in September 1992, twenty-two monitoring wells have been installed in the unconsolidated deposits on the UniFirst property. Hydraulic data developed from these additional monitoring wells have supported the assessment of contaminated groundwater capture on the UniFirst property.

Two monitoring wells in the unconsolidated deposits contain data loggers and transducers for water-level monitoring. These two wells, UC6 and UC6S, are located on the downgradient end of the UniFirst property. At the end of Year 6, software errors in these data loggers prevented collection of data at the specified intervals. Once identified, these errors were corrected and the data loggers at UC6 and UC6S have been fully operational since November 4, 1998.

The hydrographs for these two wells, provided in Appendix C, show an increasing curve during the spring and decreasing curve during the fall that is consistent with the seasonal trend. The hand measurements closely follow the data logger record.

3 ANALYTICAL DATA EVALUATION

Groundwater sample collection for VOC analysis was completed at the twenty-five monitoring well locations shown on Table 1 from April 7 through April 9, 1999. Appendix D presents the analytical data from these monitoring wells and Figure 4 in Appendix A presents the pre-pumping and post-pumping VOC analytical data of the study area.

The summary tables on Figure 4 present VOC data sets representative of pre-pumping conditions and the seven years of post-pumping VOC results, where data are available. The VOC summary figure includes concentrations of tetrachloroethene (PCE), trichloroethane (TCE), total 1,2-dichloroethene (DCE), vinyl chloride (VC), and 1,1,1-trichloroethane (TCA). Figure 4 shows those locations and/or events where cis-1,2-dichloroethene was analyzed instead of total DCE. The mapped VOC data reflect representative pre-pumping VOC results as well as the VOC results from August 1993, 1994, 1995, May 1996, April 1997, May 1997, April 1998 and April 1999, where available.

Most of the changes in analytical results that occurred during the Year 7 monitoring were insignificant relative to historic monitoring. Similar to Year 6, no VOC were detected in the unconsolidated deposit wells UC10S, UC10M, UC10D on the UniFirst property. At the three other unconsolidated deposit locations monitored on the UniFirst property, there was no change in VOC concentrations at UC6, a decrease at UC6S in PCE from 45µg/L to 5µg/L, and an increase at S71S in PCE from 61 µg/L in 1998 to 180µg/L in 1999.

The majority of the bedrock monitoring locations on the UniFirst property showed no significant changes in VOC concentrations since the Year 6 monitoring event. Minor decreases in PCE concentrations appear to have occurred at S70D from 7µg/L to no detection and S71D from 100 µg/L to 82 µg/L. A PCE increase that did not exceed a factor of two was detected in the bedrock under the UniFirst property at all UC7 locations (see Appendix A, Figure 4). As in previous years, variations in VOC concentrations continued at the UC10 bedrock locations.

In summary, the VOC concentration data collected during the Year 7 monitoring generally maintained levels detected during the Year 6 monitoring. Equilibrium conditions appear to have been reached in approximately 70 percent of the wells sampled, where no concentration change occurred or the variability has remained approximately the same since the extraction system began operation in 1992. The remaining locations showed minor increases and decreases in concentrations. However, declines appear to be continuing on the UniFirst property at two locations, UC6S and S71D.

4 GROUNDWATER EXTRACTION & TREATMENT SYSTEM PERFORMANCE

The groundwater extraction and treatment system operated for approximately 98.5 percent of the time during the seventh year of operation. Approximately 19.97 million gallons of groundwater were recovered by UC22. Throughout Year 7 the treatment system performed well, with nine unscheduled interruptions in the system operation. PCE and TCE were not present in any discharge samples above their detection limits of 0.5 µg/L. Approximately 132 pounds of PCE and 6 pounds of TCE are estimated to have been removed during the seventh year of operation.

The annual system inspection and planned maintenance were performed by AO, Inc. and BC Plumbing on September 8, 1999. Inspection forms completed during the annual inspection and planned maintenance are included in Appendix E.

During this past year, twelve monthly Operation and Maintenance summary reports were prepared by AO, Inc. and submitted to EPA.

4.1 Influent Water Quality

During the seventh year of operation, six samples of groundwater pumped from the extraction well were collected from S-1, the sample port at the inlet to the treatment system, and analyzed for VOC using EPA Method 8240. The analytical results for these samples are summarized in Appendix F.

Influent concentrations of PCE and TCE, since start-up, are plotted in Figures 1 and 2, respectively. The concentration of PCE ranged from 1,400 µg/L on March 4, 1999 to 490 µg/L on January 5, 1999. The arithmetic mean of PCE concentrations that were reported over the past year was 777 µg/L.

Influent concentrations of TCE during Year 7 showed a pattern similar to that of PCE, ranging from a low of 29 µg/L to a high of 60 µg/L. The arithmetic mean of TCE concentrations over the past year was 36 µg/L.

A summary of maximum and minimum concentrations of PCE, TCE, and several other relevant VOC are shown in Table 4. Quantification of 1,1-DCE, 1,2-DCE, and 1,1,1-TCA was not possible where these compounds were reported at or below analytical detection limits.

4.2 Discharge Water Quality

Samples of the treated groundwater were collected from the discharge sampling port S-6 monthly. In addition to the twelve S-6 discharge samples collected, duplicate samples were collected on December 1, 1998 and June 1, 1999. These duplicates were given the sample identification S-7. The discharge samples were analyzed for VOC using EPA Method 524.2 and lead using EPA Method 239.2-M. The results of the VOC and lead analyses performed for S-6 and S-7 samples are listed in

Appendix F. A summary of the discharge sampling data for Year 7, along with the discharge limits, is given in Table 5.

Lead concentrations ranged from not detectable to 3.7 µg/L on January 5, 1999. These concentrations are well below the discharge limit of 10.2 µg/L. PCE and TCE have not been present in the discharge samples above the method's detection limits of 0.5 µg/L. Concentrations for 1,1,1 TCA ranged from below the method detection limit during three months to 5 µg/L on September 5. A discharge limit for 1,1,1 TCA has not been established, however the clean up levels referenced in the Record of Decision indicate a limit of 200 µg/L.

A discharge sample collected on May 7, 1998 was analyzed for TCL/TAL compounds. The laboratory reports for these analyses are included in Appendix G. According to the report, total barium, total calcium, total iron, total magnesium, total potassium, total sodium, and cyanide were detected in the sample above the practical limit of quantification (see Table 6). The remaining compounds were reported below their detection limits.

4.3 Groundwater Pumping Rate & Recovery Well Water Level Elevations

An analysis of the data collected during the May 1991 pumping test yielded a target water-level elevation in the extraction well (UC22) of 15 feet (NGVD) for the long term remedial action. As a result of the pumping test, a pumping rate of approximately 50 gallons per minute (gpm) was targeted to maintain the desired water-level elevation. Long-term operational data indicate that an appropriate water-level elevation and groundwater capture area is achieved at pumping rates less than 50 gpm and water-level elevations above 15 feet. The optimum drawdown elevation of 15 feet above sea level was maintained during the year. Flow rate, carbon pressure, and water level elevations for the seventh year of operation are shown in Figure 3.

Water levels and flow rates remained relatively constant during Year 7, except during system down time. Section 5 describes overall system operations, including system down time. The flow rate for the operational year averaged 38 gpm, which is less than the flow rate projected from the pumping test. Nonetheless, this flow rate was sufficient to maintain the pumping water-level elevation in UC22 below the target elevation for the majority of the operational year.

During the seventh year approximately 19.97 million gallons of groundwater were extracted from UC22.

4.4 Contaminant Mass Removal

The total mass of contaminant removed has been calculated using the average of the influent concentrations of the contaminants and monthly flows. The data used in the mass removal calculations for Year 7 are presented in Appendix I. Approximately 132 pounds of PCE and 6 pounds of TCE were removed during the seventh operational year (refer to Table 7 for monthly mass removals). As indicated in Appendix I, 0.69 pounds of 1,1,1-TCA, 0.31 pounds of 1,2-DCE, and 0.16 pounds of 1,1-DCE were also removed from the subsurface by the extraction and treatment

system. Approximately 1,430 pounds of PCE and 68 pounds of TCE have been removed during the first seven years of operation. The PCE and TCE contaminant mass removed per month for each of the seven years of operation is summarized in Table 7. The cumulative recovery of PCE and TCE over time is shown graphically in Figure 4.

4.5 Ultra-Violet/Chemical Oxidation Unit Performance

The UV/Ox unit is a model SSBC-30R manufactured by Vulcan Peroxidation Systems, Inc. (VPSI). Calgon Carbon Corporation (Calgon) purchased VPSI and assumed the maintenance of the UV/Ox unit for the site. This unit has proven to be a reliable and consistently effective treatment technology providing destruction of the primary contaminants during the first seven years of operation. A summary of laboratory analyses of samples collected from the UV/Ox effluent is presented in Appendix F.

PCE was detected in four out of twelve sampling events in the UV/Ox effluent, which is followed by carbon treatment before final discharge, at concentrations of 0.52 µg/L on November 4, 1998, 12 µg/L on February 7, 14 µg/L on May 4, and 1.6 µg/L on July 6. TCE was detected in the UV/Ox effluent on four occasions (8.2 µg/L on February 7, 1.2 µg/L on April 6, 6.2 µg/L on May 4 and 3.2 µg/L on July 6).

The concentration of 1,1,1-TCA in the UV/Ox effluent was nearly the same as in the influent. These results were predicted during the development of the system design. The UV/Ox unit is not efficient at oxidizing 1,1,1-TCA, and can only do so with substantially increased contact times and chemical oxidant dosages. However, there is no discharge limit for TCA, and the influent concentrations during Year 7 have been below the clean-up target for groundwater of 200 µg/L, as identified in the ROD. Appendix F shows the effluent concentrations of TCA at sample location S-6 to be at or below 5 µg/L during Year 7.

4.6 Carbon Treatment Performance

Downstream of the UV/Ox unit are two carbon adsorption units operating in a series mode. TIGG Corporation supplied the carbon vessels (model C-50Rx). Each vessel contains 1,000 pounds of reactivated granular activated carbon (GAC). The carbon units provide continuous back-up treatment (by contaminant adsorption) for situations when the UV/Ox unit is non-operational or does not provide complete destruction of the contaminants.

Carbon treatment performance is tracked by collecting and analyzing samples between the two carbon vessels from sample port S-5C, and the effluent from the second tank which is the final discharge, is monitored at sample port S-6. The water quality data for the intermediate carbon point, S-5C, is listed in Appendix F.

The presence of TCA in the final discharge is used as an indicator of "breakthrough". There is no discharge limit for this compound and the average influent concentration is well below the clean-up target goal for groundwater of 200 µg/L. In addition, the saturated loading capacity of TCA is relatively low in comparison with the principal groundwater contaminants of TCE and PCE. The

effective loading capacity at carbon saturation of PCE and TCE are approximately 30 and 7 times greater than that of TCA, respectively. For all these reasons, TCA provides a conservative means of tracking carbon adsorption performance for the other compounds and assures that adequate treatment will occur when the UV/Ox unit is non-functional or operating at a reduced efficiency.

Permanent vessels were installed to replace disposable vessels during Year 2. Carbon changes during Year 3 through Year 7 involved replacing only the spent carbon medium versus both the vessel and spent medium. The carbon vessels are fitted with flexible inlet and outlet hoses that allow changing the hydraulic position of the vessels without physically moving them. This facilitates change out by allowing one vessel to remain on line while the other drains and carbon medium is replaced. Refer to Section 5.1.2 for a discussion of the carbon usage for Year 7.

5 SYSTEM OPERATION AND MAINTENANCE

5.1 Operation Summary

During the seventh year of operation the remedial system had negligible downtime. The reliability of the groundwater extraction and treatment system is demonstrated by the entire system "on-line" time being approximately 98.5 percent of the total elapsed time during the past year. The system was shut down on nine occasions in Year 7. The unscheduled events caused the entire system to be "down" and are described in detail below. The dates, duration, and cause of system downtime are summarized in Table 8.

Of the nine unscheduled shut downs, five have been attributed to area power failures or "brown-out" conditions. Two of the events probably were the result of moisture in one of the UV/Ox lamp enclosures. When the UV/Ox unit senses moisture in a lamp enclosure, the response is a unit shutdown. The control system is programmed to shut down the groundwater extraction pump when UV/Ox unit failure of this type occurs.

During the UV/Ox unit repairs, the extraction system continues to operate with complete treatment provided by the carbon tanks. In addition, during carbon changes, one unit is left "on-line," to provide treatment of the groundwater before discharging while the other unit is rebedded with fresh carbon. This accounts for the apparent discrepancies between the downtime for the entire groundwater extraction and treatment system and the UV/Ox unit.

Ultraviolet/Chemical Oxidation Unit

The UV/Ox unit was operational approximately 8,599 hours during the seventh year of operation, or about 98.2 percent of the time. The UV/Ox unit downtime was coincident with the unscheduled system downtime described above. During the carbon changes the UV/Ox unit remained "on-line" and therefore, the downtime for these activities was not included in the calculation. Calgon's service technician, as part of its service agreement, performed routine maintenance on the unit. This included replenishing the hydrogen peroxide supply, replacing the UV/Ox lamp enclosure seals, and

calibrating the H_2O_2 pumps. Some of the non-routine maintenance included replacing the UV/Ox lamps and quartz tubes.

The UV/Ox unit operates on three of the six available lamps and continues to provide efficient destruction of the primary contaminants of concern (PCE and TCE). The current average instantaneous power demand by the unit is approximately 15,000 watts.

Calgon supplies hydrogen peroxide, the oxidant utilized by the UV/Ox unit, in a 50 percent solution. Approximately 580 gallons or 5,800 pounds of the H_2O_2 solution was used during the past year of operations, as reported by Calgon. Based on the total annual flow, an average of approximately 0.29 lbs. of the H_2O_2 solution was used per 1,000 gallons of groundwater treated or an average dosage of about 17 mg/L of H_2O_2. The residual H_2O_2 concentration in the UV/Ox unit effluent generally ranged from 8 to 10 µg/L as determined by field colorimetric methods (see Appendix H). The downstream carbon vessels remove residual H_2O_2.

Carbon Tanks

The carbon vessels provided back-up treatment and polishing of the system discharge during the seventh year of operation with minimal maintenance requirements.

Elevated concentrations of PCE in the midpoint carbon sample were measured in the latter part of 1998. Therefore, the primary carbon vessel was taken off-line to allow change-out of the spent granular activated carbon (GAC) on February 4, 1999. During this time, the secondary unit remained in service to provide back-up treatment. The spent GAC was removed from the vessel and replaced with fresh GAC. The carbon vessel was filled with water and brought on-line in the secondary position on February 6, 1999. Service Tech, Inc. supplied and installed the fresh virgin carbon medium and removed and managed the spent carbon.

After the carbon change, the carbon vessel was backwashed to remove "carbon fines" that are typically present in a carbon bed. After the carbon change, the carbon pressure has remained relatively stable throughout the remainder of the operation year. Periodic venting of accumulated air in the carbon vessels appears to help prevent undesirable high carbon pressures from developing.

Based on the flow rates and amount of spent carbon, the total carbon usage rates were 63.1 pounds/million gallons (MG) from April 16, 1998 to February 2, 1999. These usage rates were calculated using the following equation:

Carbon Usage Rate = (Carbon Mass) / (Sum of Flow Rates for Time Period [MG])

5.2 Maintenance Summary

The treatment system maintenance activities performed during the seventh year of operation fall into two general categories, routine and non-routine, both of which are briefly discussed below.

Routine Maintenance and System Monitoring

Fifty-two routine system inspections were conducted during the past year on a weekly basis. During each inspection an operation log was completed by AO, Inc., and filed on-site. In addition to the on-site inspections, AO reviewed operational parameters and downloaded the data via a modem link to the data logger on an average frequency of once per week.

Routine maintenance tasks are generally scheduled to coincide with the system inspections. Routine maintenance consists of injecting the previously settled backwash water back into the treatment system and backwashing the multi-media filter and carbon units, if needed. The dates that the multimedia filter and the primary and secondary carbon were backwashed are shown on Table 9.

The Calgon service technician performed routine inspections and maintenance of the UV/Ox unit as part of Calgon's lease agreement. Calgon performed routine maintenance twice per month. On October 26, 1998 and February 6, 1999, Calgon had peroxide delivered to the site.

Non-Routine Maintenance

Non-routine maintenance performed involved one carbon change. The carbon in the primary vessel was replaced with virgin carbon on February 2, 1999.

On September 23, 1999, BC Plumbing replaced the flow sensor adjacent to the pressure relief valve.

5.3 Quarterly Sensor Check

There are three sensors incorporated into the treatment system, one flow sensor and two pressure transducers. The accuracy of these sensors was evaluated on April 20, 1999, July 31, 1999 and October 5, 1999. When the checks indicated that the acceptable margins of error had been exceeded, adjustments were made to correlate the sensor outputs with the manual readings. Quarterly sensor calibration checklists were completed to provide documentation of the sensor checks. Copies of these checklists are filed on-site.

5.4 Annual Inspection & Maintenance

On September 8, 1999, AO performed the annual inspection of the treatment system. The completed checklist is included in Appendix E. All components passed inspection. The need for two minor repairs was noted and these items are being addressed.

On September 8, 1999, BC Plumbing replaced components in the diaphragm check valve and the pressure-reducing valve. The completed maintenance checklist, prepared by B.C. Plumbing, is included in Appendix E.

5.5 System Modifications

As proposed in the Year 6 Report, an alarm signal was programmed into the UC22 data logger

system to notify the system operator if the UC22 water level rises above an elevation of 25 feet for a period of one hour or longer.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Monitoring System

The water-level elevation data collected during the Year 7 annual monitoring showed similar elevations and area of groundwater capture relative to the elevations collected during Year 6.

The VOC concentrations detected during the Year 7 sampling event showed equilibrated conditions at a majority of the monitoring well locations. Locations where minor increases and decreases in VOC concentrations were detected, relative to previous monitoring results, require continued monitoring to determine if these trends continue.

The water-level elevation data and VOC concentrations continue to demonstrate that the groundwater capture area is larger than the intended area as described in Section 2.0 of this report. UniFirst will consider reductions in the scope of the monitoring system based on the continued equilibrium conditions observed in the data.

6.2 Treatment System

The system has provided complete treatment of almost 20 million gallons of groundwater, during the seventh year of operation, and a cumulative total of 154.5 million gallons during seven years of operation.

Due to the success of this system in achieving the extraction and treatment goals, no significant operation or system adjustments are required at this time.

The system's capital and equipment replacement costs are relatively small when compared to the long-term operational cost. Therefore, continuing engineering reviews will be performed to evaluate possible methods to optimize the system's operational efficiency for reducing operation and/or maintenance costs without comprising its effectiveness.

UniFirst performed a non-quantitative economic analysis of groundwater treatment costs during the five-year review of the system. Based on the results of that analysis UniFirst recommended that the existing UV/Ox with GAC back-up system be replaced with a treatment system that more cost-effectively addresses the measured, stable influent concentrations. Based on the preliminary technology assessment performed during the five-year review, it appears that GAC would be the preferred technology. UniFirst plans to perform a more detailed feasibility assessment of the carbon only treatment, and present the results to EPA along with a final design of the selected system.

The UV/Ox unit is operating on a renewed one-year lease. Both the flow rate and the influent concentrations have declined during the first seven years. The anticipated influent concentrations of

contaminants were originally projected from groundwater quality data collected during the 30-day pump test in May of 1991. The UV/Ox unit was sized to be able to treat up to 10,000 µg/L of PCE at a flow rate of 50 gpm. Measured conditions during Year 7 indicate that the average influent concentration is approximately 800 µg/L and a flow rate of less than 40 gpm will maintain the capture zone. Under these conditions and reasonably foreseeable future operating conditions, carbon treatment alone would provide the same level of treatment and reliability for less cost.

TABLE 1
Monitoring Wells Sampled for VOC

GO1DB	UC6	UC10-2
S70D	UC6S	UC10-3
S71S	UC7-1	UC10-4
S71D	UC7-2	UC10-5
S81S	UC7-3	UC10-6
S81M	UC7-4	UC10S
S81D	UC7-5	UC10M
UG1-4	UC10-1	UC10D
		UC11-2

TABLE 2
Monitoring Wells in the Water Level Monitoring Network

DP1S	S65M	UC9-2	UC22*
DP1D	S65DR	UC9-4	UC23-1
DP2S	S66D	UC9-6	UC23-2
DP2M	S67S	UC10S	UC23-3
DP2D	S67M	UC10M	UC23-4
DP3	S67D	UC10D	UC23-5
DP36	S69D	UC10-1	UC24S
DP37S	S70S	UC10-2	UC24D
DP37D	S70M	UC10-3	UC25
K42S	S70D	UC10-4	UC26S
K42M	S71S	UC10-5	UC26D
K42D	S71D	UC10-6	UC29S
GO1S	S81S	UC11-2	UC29D
GO1D	S81M	UC11-6	UC30
GO1DB	S81D	UC12-1	UC31S
IUS1	S82	UC12-2	UC31M
IUS2A	S97S	UC12-3	UC31D
IUS2B	S97M	UC12-4	UG1-1
IUS2C	S97D	UC12-5	UG1-2
IUS3A	UC4	UC12-6	UG1-3
IUS3B	UC5	UC15S	UG1-4
IUS3C	UC6S*	UC15D	UG1-5
S7R	UC6*	UC16	UG1-6
S63S	UC7A-1	UC17	UG1-7
S63D	UC7A-2	UC18	UC32
S64S	UC7A-3	UC19S	UC33
S64M	UC7A-4	UC19D	UC34
S64D	UC7A-5	UC19	UC35
S65S	UC8	UC20	UC36

* Wells monitored both manually and with data loggers set to record every 60 minutes, except for UC22, which records every 15 minutes.

TABLE 3

Location of Monitoring Well Screened Intervals

WELL DATA				WELL DATA				WELL DATA			
WELL NO.	GEO. UNIT	TOS EL FT	BOS EL FT	WELL NO.	GEO. UNIT	TOS EL FT	BOS EL FT	WELL NO.	GEO. UNIT	TOS EL FT	BOS EL FT
DP1S	DR	45.50	44.4	S70S	SR	54.00	39.00	UC15S	DPB	-10.00	-20.00
DP1D	DR	45.40	34.4	S70M	DR	27.00	7.00	UC15D	DPB	-202.00	-212.00
				S70D	SHB	2.00	-13.00				
DP2S	DR	44.47	43.4					UC16	SHB	62.00	44.00
DP2M	DR	30.12	29.1	S71S	DR	60.00	55.00				
DP2D	DR	14.80	13.8	S71D	SHB	49.00	29.00	UC17	SHB	62.00	44.00
DP3	DR	45.22	44.2	S81S	DR	44.00	34.00	UC18	SHB	60.00	40.00
				S81M	DR	20.00	5.00				
DP25	DR	48.91	47.9	S81D	SHB	-13.00	-28.00	UC19S	DR	64.40	54.40
								UC19M	DR	43.30	38.30
DP36	DR	51.02	50.0	S82	DR	32.00	22.00	UC19	SHB	31.00	12.00
DP37S	DR	45.82	44.8	S97S	DR	40.00	35.00	UC20	SHB	65.00	46.00
DP37D	DR	42.75	41.7	S97M	DR	26.00	24.00				
				S97D	SHB	12.00	5.00	UC22	SHB	70.00	-105.00
DP38	DR	70.74	69.7								
				UC4	SHB	64.00	54.00	UC23-5	DPB	-141.00	-152.00
GO1S	DR	65.00	55.0					UC23-4	DPB	-164.00	-174.00
GO1D	SHB	49.00	34.0	UC5	DR/SHB	64.00	54.00	UC23-3	DPB	-197.00	-213.00
GO1DB	DPB	18.00	3.0					UC23-2	DPB	-283.00	-293.00
				UC6S	DR	59.50	49.50	UC23-1	DPB	-303.00	-308.00
IUS1	SHB	76.00	61.0	UC6	DR	35.00	25.00				
								UC24S	DR	60.90	50.90
IUS2C	DR	51.00	41.0	UC7A-5	DR	71.00	53.00	UC24D	DR	22.80	17.80
IUS2B	DR	21.00	6.0	UC7A-4	SHB	50.00	9.00				
IUS2A	SHB	-10.00	-28.0	UC7A-3	DPB	6.00	-18.00	UC25	DR	66.40	56.40
				UC7A-2	DPB	-21.00	-46.00				
IUS3C	DR	62.00	42.0	UC7A-1	DPB	-60.00	-77.00	UC26S	DR	60.19	53.39
IUS3B	DR	37.00	22.0					UC26D	DR	39.31	34.31
IUS3A	DR/SHB	20.00	4.0	UC8	DR/SHB	69.00	54.00				
								UC29S	DR	60.82	54.02
K42S	DR	35.90	34.9	UC9-6	SHB	67.00	47.00	UC29D	DR	50.91	45.91
K42M	DR	11.30	10.3	UC9-4	DPB	-18.00	-28.00				
K42D	DR	-9.2	-10.	UC9-2	DPB	-86.00	-97.00	UC30	DR	64.78	58.98
S6	DR/SHB	54.00	-36.0	UC10S	DR	59.60	49.60	UC31S	DR	58.36	52.26
				UC10M	DR	38.80	33.80	UC31M	DR	40.41	35.41
S7	DR/SHB	90.80	66.8	UC10D	DR	20.10	23.10	UC31D	DR	22.52	17.52
S63S	DR	58.00	48.0	UC10-6	DPB	-8.00	-23.00	UC32	DR	67.47	66.82
S63D	SHB	44.00	34.0	UC10-5	DPB	-55.00	-59.00				
				UC10-4	DPB	-78.00	-88.00	UC33	DR	62.89	66.24
S64S	DR	48.00	43.0	UC10-3	DPB	-102.00	-112.00				
S64M	DR	31.00	26.0	UC10-2	DPB	-145.00	-157.00	UC34	DR	68.91	68.26
S64D	SHB	18.00	3.0	UC10-1	DPB	-161.00	-173.00				
								UC35	DR	66.59	65.94
S65S	DR	31.00	21.0	UC11-6	DPB	29.00	19.00				
S65M	DR	50.00	40.0	UC11-4	DPB	-95.00	-103.00	UC36	DR	68.11	67.46
S65DR	SHB	73.00	53.0	UC11-2	DPB	-183.00	-203.00				
				UC11-1	DPB	-250.00	-265.00	UG1-7	DPB	-38.00	-48.00
S66D	SHB	50.00	35.0					UG1-6	DPB	-75.00	-86.00
				UC12-6	DPB	24.00	16.00	UG1-5	DPB	-91.00	-99.00
S67S	DR	59.00	49.0	UC12-5	DPB	-3.00	-20.00	UG1-4	DPB	-143.00	-154.00
S67M	DR	50.00	40.0	UC12-4	DPB	-72.00	-87.00	UG1-3	DPB	-301.00	-317.00
S67D	SHB	23.00	8.0	UC12-3	DPB	-126.82	-127.32	UG1-2	DPB	-397.00	-408.00
				UC12-2	DPB	-203.06	-203.56	UG1-1	DPB	-413.00	-416.00
S69	SHB	35.00	20.0	UC12-1	DPB	-238.00	-268.00				

Key: DR = glacial drift SHB = shallow bedrock DPB = deep bedrock TOS = top of screen BOS = bottom of screen

Note: All well screen depths are elevations in feet above national geodetic vertical datum.

TABLE 4
Year 7 Influent VOC Concentration Summary

Parameter	Minimum	Maximum
Tetrachloroethene (PCE)	490 µg/L	1,400 µg/L
Trichloroethene (TCE)	29 µg/L	60 µg/L
1,1 Dichloroethene (1,1 DCE)	0.6 J (1.0) µg/L	<5 µg/L
1,2 Dichloroethene (1,2 DCE)	4 (2.0) µg/L	<10 µg/L
1,1,1-Trichloroethane (1,1,1 TCA)	4 (1.0) µg/L	5 J µg/L

Values in parentheses are the detection limits.
J is an estimated concentration.

TABLE 5
Year 7 Discharge Concentration Summary

Parameter	Discharge Limit[1] (µg/L)	Minimum (µg/L)	Maximum (µg/L)
1,1 Dichloroethene (1,1-DCE)	7	<0.5 (0.5)	<0.5 (0.5)
1,2 Dichloroethene (1,2-DCE)	70	<0.5 (0.5)	<0.5 (0.5)
1,1,1-Trichloroethane (1,1,1-TCA)	No Limit	.3J (<0.5)	4 (0.5)
Tetrachloroethene (PCE)	5	<0.5 (0.5)	<0.5 (0.5)
Carbon Tetrachloride	5	<0.5 (0.5)	<0.5 (0.5)
Benzene	5	<0.5 (0.5)	<0.5 (0.5)
Trichloroethene (TCE)	5	<0.5 (0.5)	<0.5 (0.5)
Lead	10.2	<1.3	3.7B

Detection limits for VOC are presented in parentheses.

[1] The discharge limits are for average monthly concentrations.

J (VOC) or B (Lead) indicates an estimated value, the result was below the detection limit

TABLE 6
Year 7 TCL/TAL Analytical Results for S-6

Parameter	Result (µg/L)
Barium	14.4
Calcium	109,000
Iron	38.0
Magnesium	13,000
Potassium	2,260
Sodium	72,700
Cyanide, total	20
Chloroform	1.0
1,1,1-TCA	1.0
1,1-Dichlorethane	0.9

TABLE 7
Chemical Mass Removal Rates

PCE (lbs.)

Month	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999
Oct	15.4	28.8	15.0	14.3	9.1	10.4	8.4
Nov	23.4	28.1	20.2	15.6	17.4	9.4	9.6
Dec	25.3	26.1	11.6	17.3	12.3	11.9	8.1
Jan	31.9	34.7	16.6	17.8	11.5	10.0	6.7
Feb	24.3	12.0	23.4	13.5	11.7	10.0	12.7
Mar	34.0	30.0	37.8	10.5	11.1	8.8	20.4
Apr	24.7	30.8	24.8	14.7	12.9	14.0	16.3
May	33.9	27.8	16.9	18.9	11.6	12.2	11.8
Jun	37.3	22.4	15.6	14.7	10.5	9.9	7.1
Jul	34.4	23.1	15.7	11.4	12.4	12.1	9.5
Aug	25.7	21.2	14.4	11.4	10.5	9.2	10.5
Sep	21.5	19.3	12.5	11.0	11.5	7.0	10.5
Total	331.8	304.3	224.5	171.1	142.5	124.7	131.7

TCE(lbs.)

Month	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999
Oct	1.00	1.50	1.10	0.80	0.40	0.55	0.41
Nov	1.90	1.40	1.20	0.80	0.50	0.50	0.41
Dec	1.90	1.40	1.10	0.90	0.90	0.49	0.42
Jan	2.10	1.40	0.70	1.00	0.50	0.41	0.43
Feb	1.60	0.40	0.70	0.80	0.50	0.41	0.61
Mar	1.80	0.80	0.80	0.60	0.50	0.23	0.88
Apr	1.60	0.90	0.80	0.60	0.50	0.48	0.70
May	1.50	1.20	0.90	0.60	0.40	0.51	0.50
Jun	1.60	0.90	0.80	0.60	0.40	0.43	0.40
Jul	1.70	1.00	0.80	0.80	0.60	0.37	0.44
Aug	1.40	1.00	0.80	0.70	0.50	0.44	0.47
Sep	1.20	1.00	0.80	0.70	0.60	0.40	0.46
Total	19.3	12.9	10.5	8.9	6.3	5.2	6.1

Total (lbs)

Month	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999
Oct	16.4	30.3	16.1	15.1	9.5	10.9	8.84
Nov	25.3	29.5	21.4	16.4	17.9	9.9	10.04
Dec	27.2	27.5	12.7	18.2	13.2	12.4	8.52
Jan	34.0	36.1	17.3	18.8	12.0	10.4	7.17
Feb	25.9	12.4	24.1	14.3	12.2	10.4	13.29
Mar	35.8	30.8	38.6	11.1	11.6	9.0	21.30
Apr	26.3	31.7	25.6	15.3	13.4	14.4	17.02
May	35.4	29.0	17.8	19.5	12.0	12.7	12.30
Jun	38.9	23.3	16.4	15.3	10.9	10.4	7.46
Jul	36.1	24.1	16.5	12.2	13.0	12.5	9.93
Aug	27.1	22.2	15.2	12.1	11.0	9.6	10.93
Sep	22.7	20.3	13.3	11.7	12.1	7.4	10.99
Total	351.1	317.2	235.0	180.0	148.8	129.9	137.79

TABLE 8
Groundwater Extraction and Treatment System
Year 7 Downtime Summary

Date	Unscheduled (Hours)	Reason/Cause
10/05/98	3	Unknown
03/10/99	8	UV/Ox lamp moisture
04/19/99	5	UV/Ox unit
07/02/99	6	Power outage
07/06/99	36	Power outage
07/12/99	9	Power outage
07/25/99	11	Power outage
09/02/99	7	Power outage
09/07/99	46	Pump electrical control repairs
Totals	131.0	

Percentage Downtime (8,760-131)/8,760 = 98.5%

TABLE 9
Backwash Events 1999

Carbon Tanks		MultiMedia
Primary	Secondary	Sand Filter
14-Oct-98	27-Oct-98	19-Nov-98
20-Oct-98	29-Oct-98	10-Jan-99
27-Oct-98	28-Nov-98	19-May-99
16-Nov-98	28-Jan-99	
26-Dec-98	10-Mar-99	
24-Jan-99	04-Jun-99	
06-Feb-99	20-Jul-99	
27-Feb-99	17-Aug-99	
09-Mar-99		
16-Mar-99		
15-Apr-99		
26-May-99		
30-Jun-99		
31-Jul-99		
25-Aug-99		

Figure 1 - Influent Tetrachloroethene Concentration

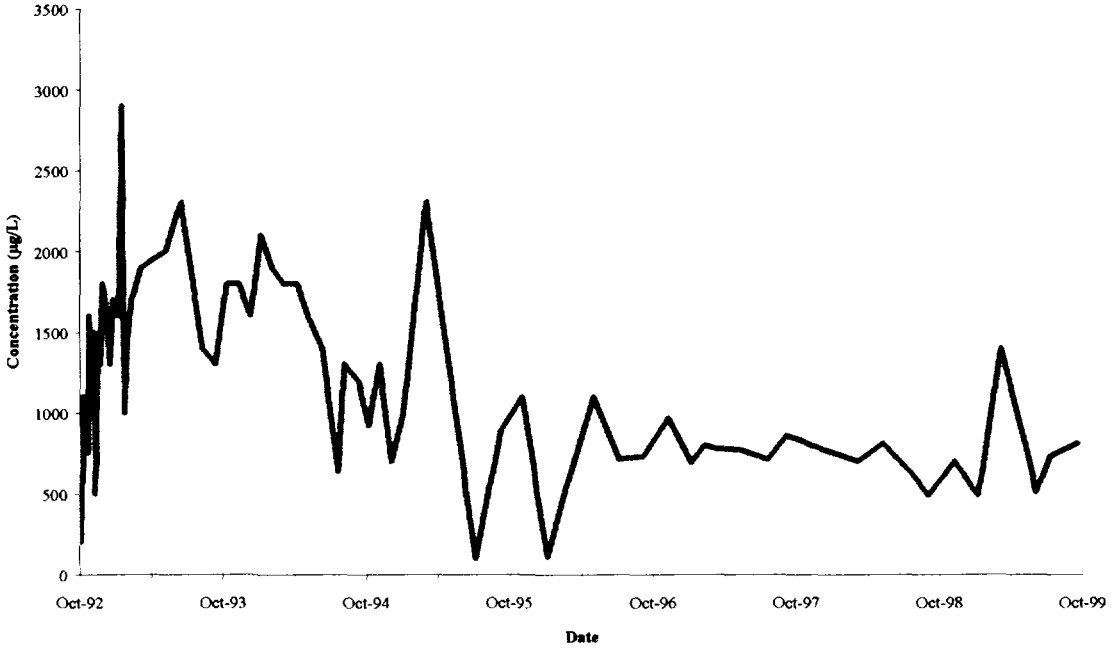
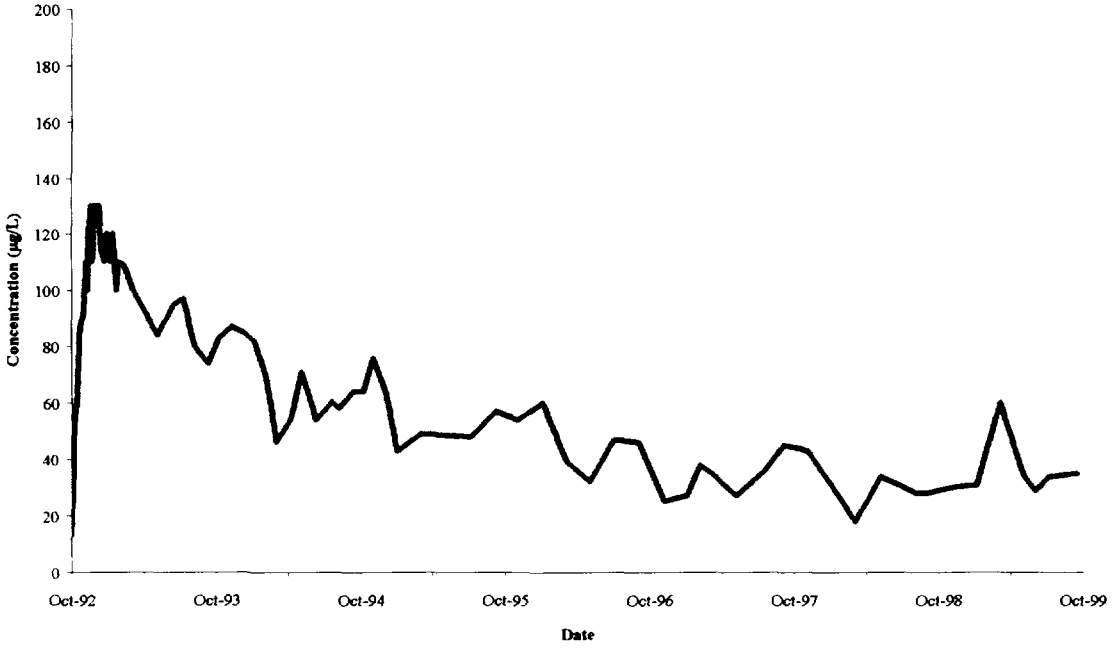


Figure 2 - Influent Trichloroethene Concentration



Original includes color coding.

Figure 3 - UniFirst Ground Water Treatment Plant, Woburn, Year 7 Operations

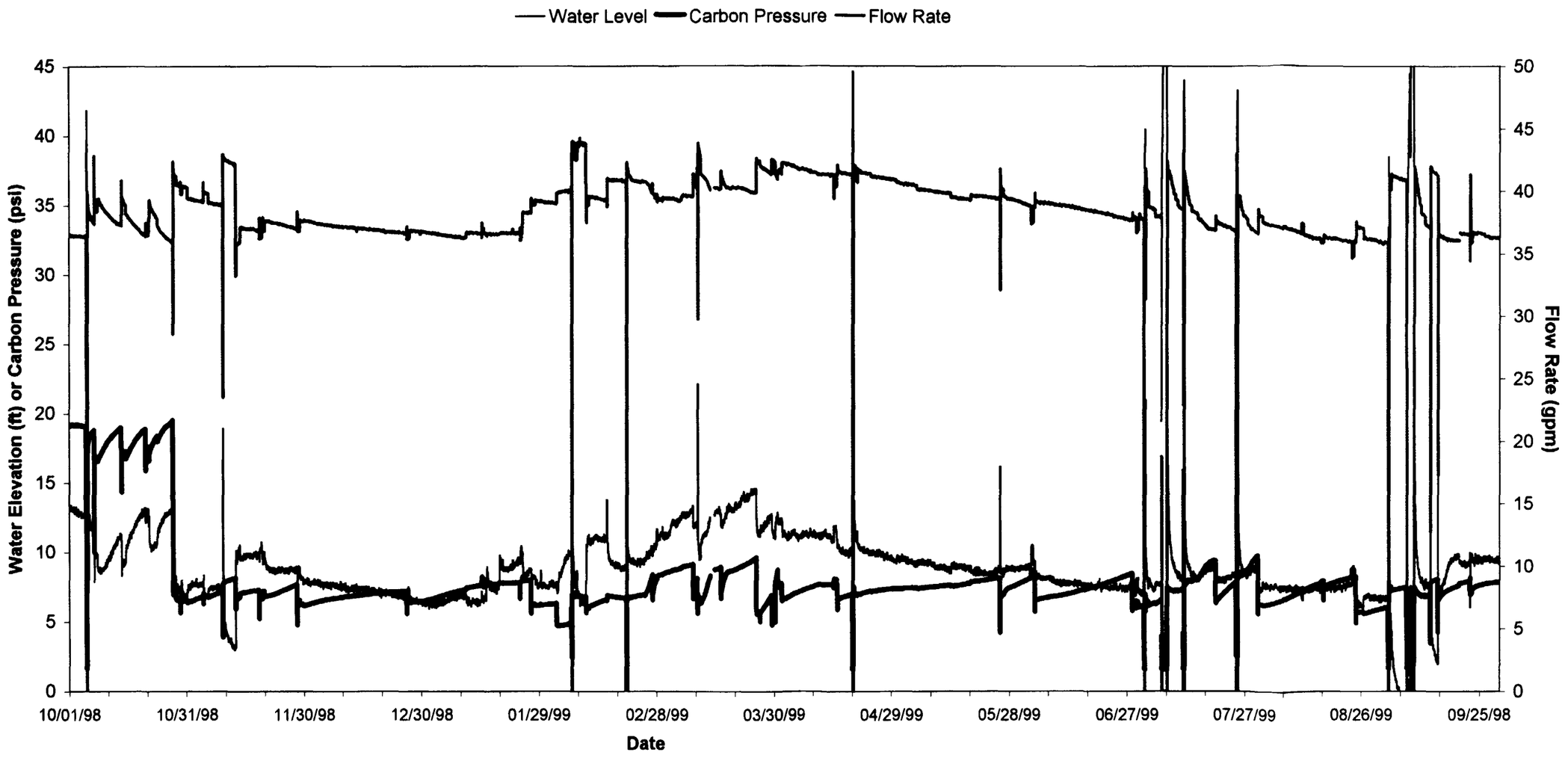
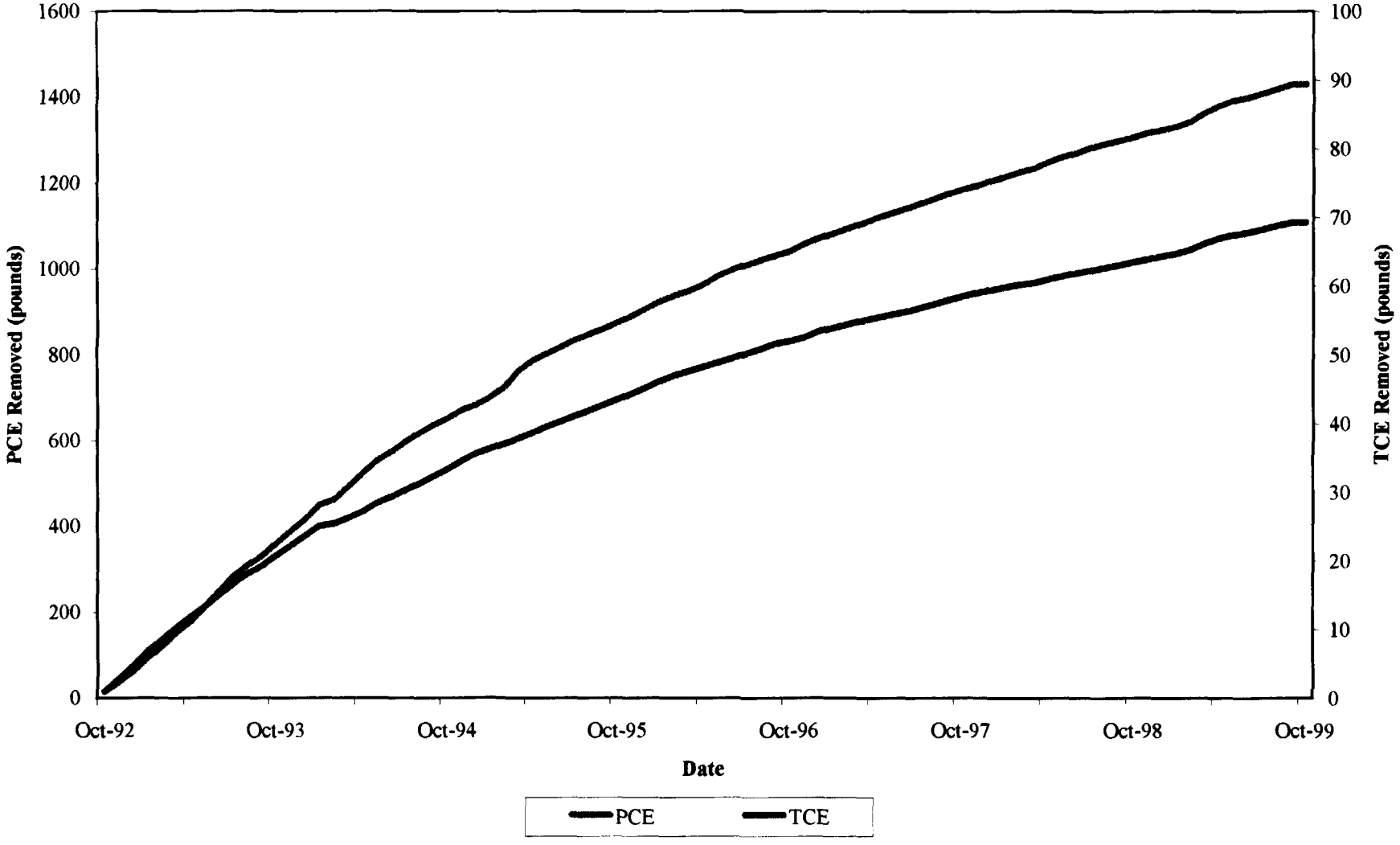


Figure 4 - Cumulative Chemical Recovery



Original includes color coding.

Appendix A

Potentiometric Maps
& Cross-Sections

TARGET SHEET

THE MATERIAL DESCRIBED BELOW
WAS NOT SCANNED BECAUSE:

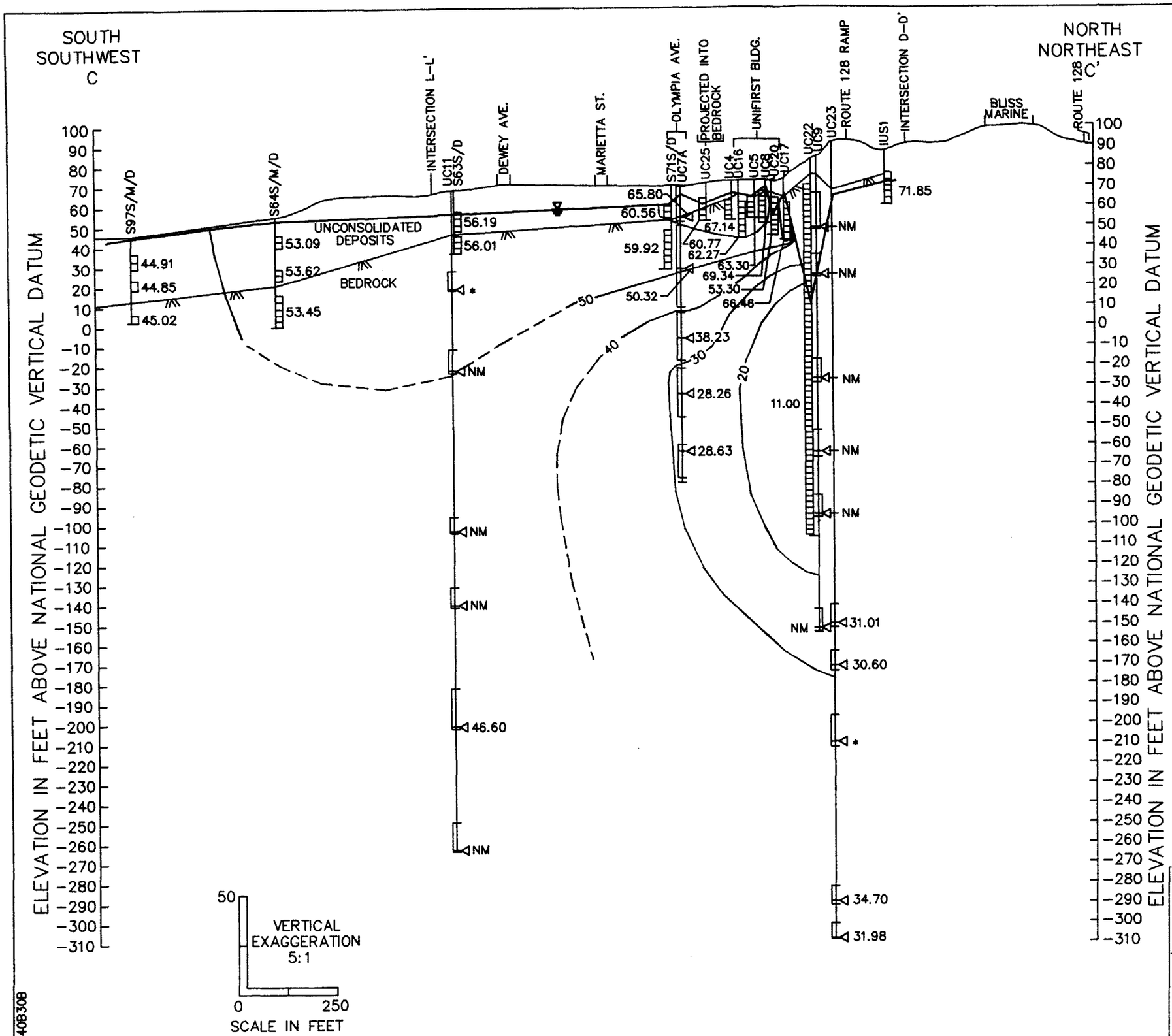
(X) OVERSIZED MAP

() NON-PAPER MEDIA

() OTHER:

DOC ID: 223120
DATE: 11/15/1999
TITLE: REMEDIAL DESIGN / REMEDIAL ACTION (RD/RA) YEAR 7 ANNUAL REPORT FOR THE UNIFIRST SITE, GROUNDWATER EXTRACTION, TREATMENT, MONITORING AND CAPTURE SYSTEM PERFORMANCE
DESCRIPTION: FIGURE 1: POTENTIOMETRIC CROSS-SECTIONS ON 10/7-8/98 OF THE NORTHEAST QUADRANT

THE OMITTED MATERIAL IS AVAILABLE FOR REVIEW
BY APPOINTMENT
AT THE EPA NEW ENGLAND SUPERFUND RECORDS CENTER,
BOSTON, MA



NOTE 1: THE SHALLOWEST WELL CONTAINING WATER WAS USED TO PLOT THE POTENTIOMETRIC SURFACE.

2: THE EXTENT OF THE UC22 DRAWDOWN CONE IS ESTIMATED TO BE LOCAL.

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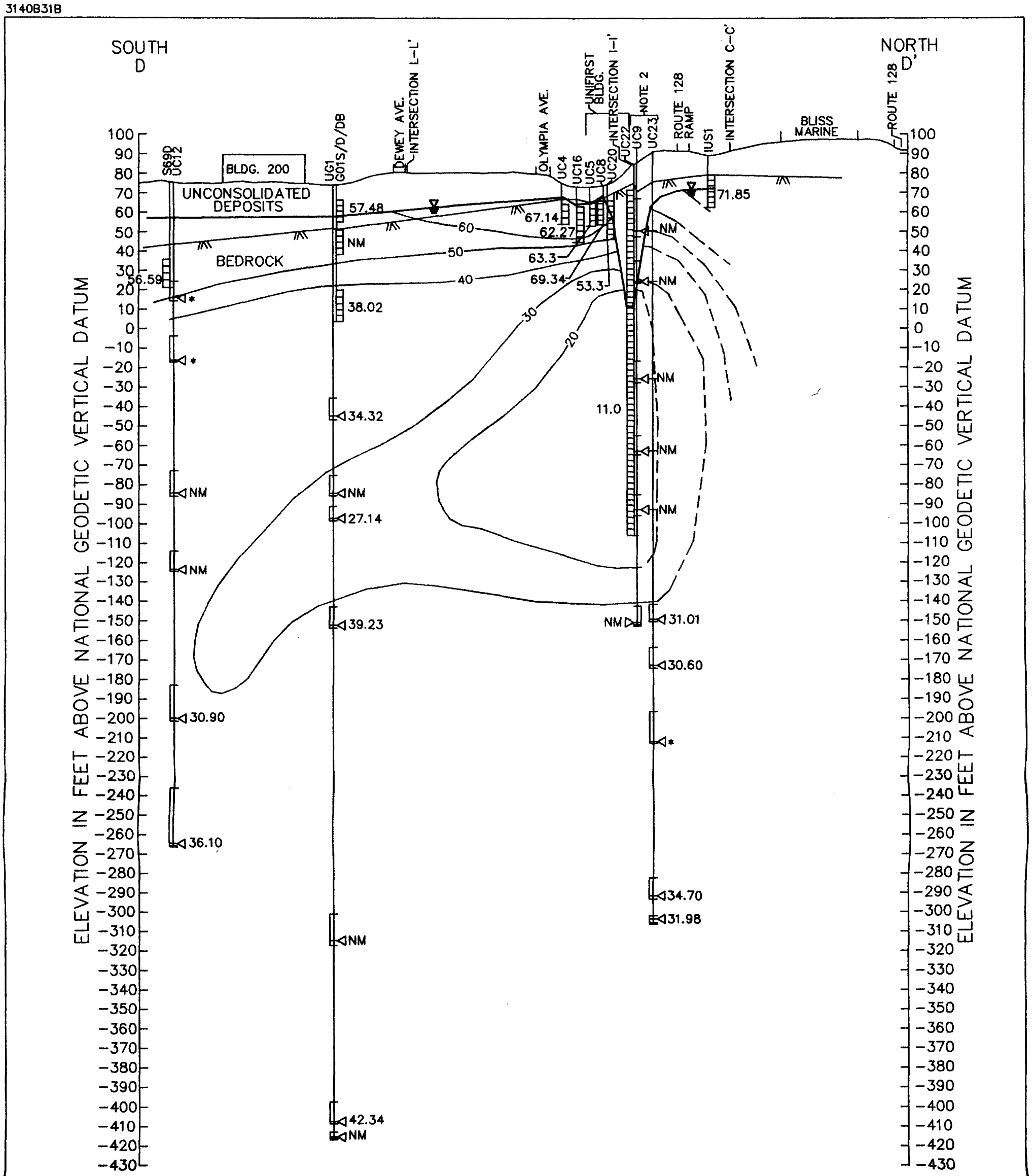
FIGURE 1A

POTENTIOMETRIC CROSS–SECTION C–C'
MEASURED IN APRIL, 1999

3140B308

3140B31B



EXPLANATION

71.85 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 1999

OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION

60 — EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

NM — NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT

* — ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

50 — VERTICAL EXAGGERATION 5:1

0 250 SCALE IN FEET

NOTE:
1. THE SHALLOWEST WELL CONTAINING WATER WAS USED TO PLOT THE POTENTIOMETRIC SURFACE.
2. THE POSITION OF WELL UC23 IS ADJUSTED TO THE NORTH < 50' TO GRAPHICALLY ILLUSTRATE THIS WELL DUE TO OVERLAP OF UC9 AND UC23 ON ALIGNMENT D-D'.
3. THE EXTENT OF THE UC22 DRAWDOWN CONE IS ESTIMATED TO BE LOCAL.

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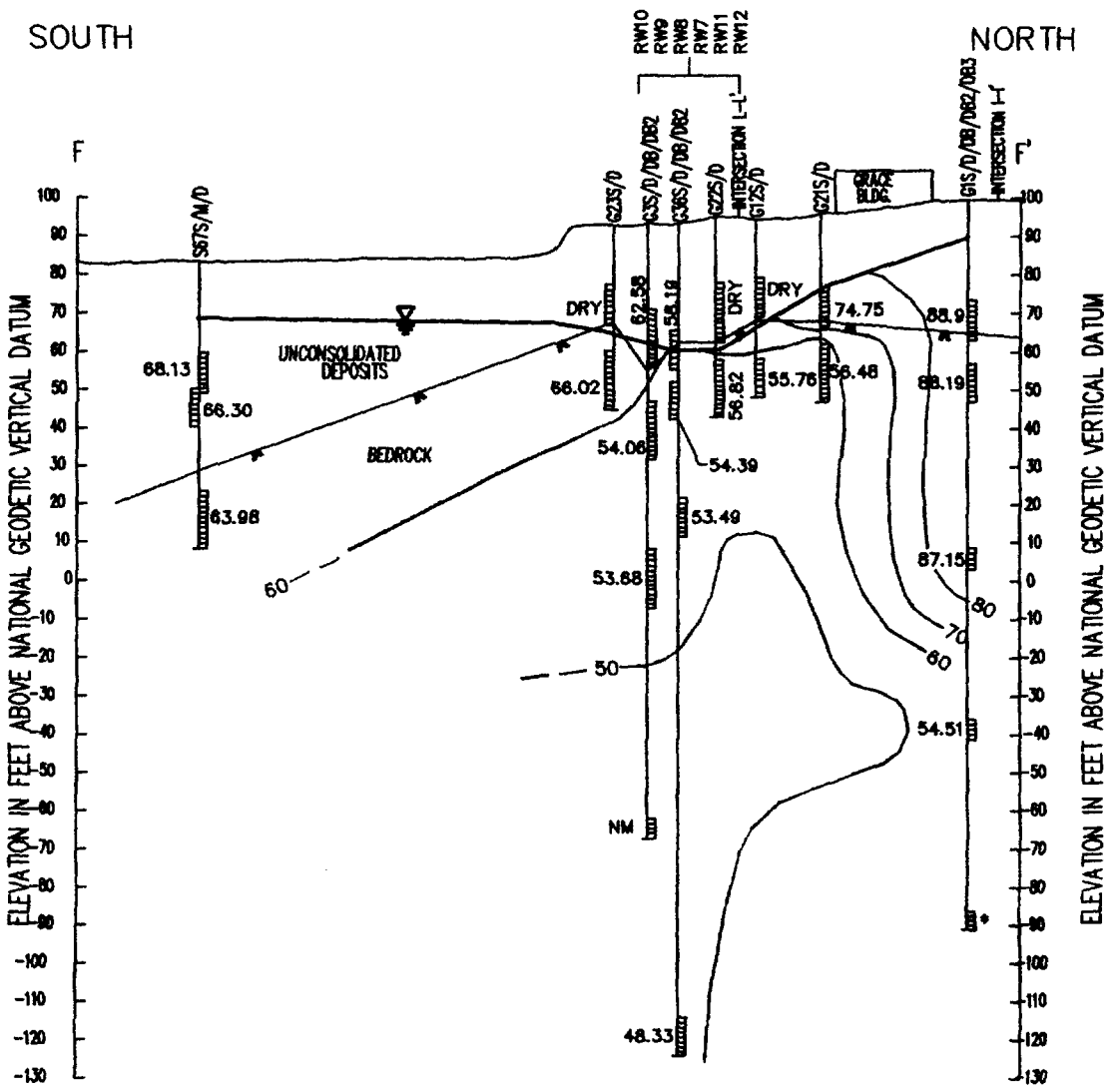
FIGURE 1B

POTENTIOMETRIC CROSS-SECTION D-D'
MEASURED IN APRIL, 1999

3140B34B



EXPLANATION

74.52 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 1999

60 — EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

* — ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

50 — VERTICAL EXAGGERATION 5:1

0 250 SCALE IN FEET

NOTE: 1. THE SHALLOWEST WELL CONTAINING WATER WAS USED TO PLOT THE POTENTIOMETRIC SURFACE.

2. GRACE RECOVERY WELL WATER LEVELS PROJECTED TO SECTION.

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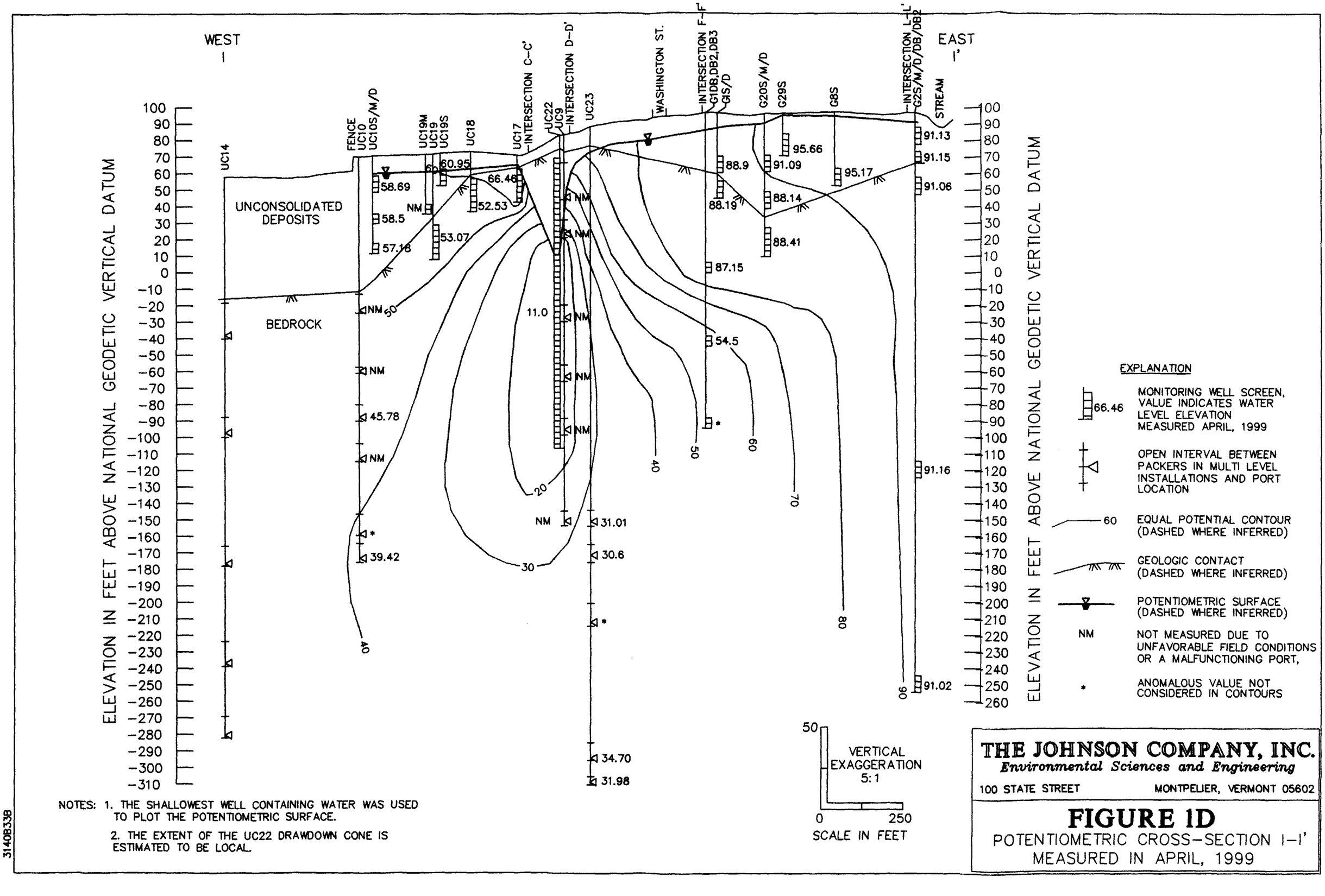
FIGURE 1C

POTENTIOMETRIC CROSS-SECTION F-F'
MEASURED IN APRIL, 1999



NOTES: 1. THE SHALLOWEST WELL CONTAINING WATER WAS USED TO PLOT THE POTENTIOMETRIC SURFACE.

2. THE EXTENT OF THE UC22 DRAWDOWN CONE IS ESTIMATED TO BE LOCAL.

3140833B

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FIGURE 1D

POTENTIOMETRIC CROSS-SECTION I-I'
MEASURED IN APRIL, 1999

3140B32B

SOUTHWEST
L

NORTHEAST
L'

INTERSECTION C-C'
UG1 S63S/D
S82
56.19
56.01
48.7
UNCONSOLIDATED DEPOSITS
BEDROCK
NM
UG1 G01S,D,DB
57.48
NM
38.02
34.32
30
NM
27.14
NM
39.23
DEWEY AVE.
INTERSECTION D-D'
HOBSON AVE.
WASHINGTON ST.
G36S/D/DB/DB2
G12S/D
G22S/D
INTERSECTION F-F'
DRY
DRY
58.19
54.39
56.82
55.76
53.49
G28S/D
71.52
65.29
G13S/D
74.11
75.63
G19S/M/D
91.87
89.36
88.29
G16S/D
G17S/D
92.67
94.68
95.06
82.92
G27S/D
93.97
93.44
INTERSECTION I-I'
G2S/M/D/DB/DB2
STREAM
91.13
91.15
91.06
48.33
91.16
91.02
NM
46.60
NM
42.34
NM
40
50
60
70
80
90

100 90 80 70 60 50 40 30 20 10 0 −10 −20 −30 −40 −50 −60 −70 −80 −90 −100 −110 −120 −130 −140 −150 −160 −170 −180 −190 −200 −210 −220 −230 −240 −250 −260 −270 −280 −290 −300 −310 −320 −330 −340 −350 −360 −370 −380 −390 −400 −410 −420

50
VERTICAL EXAGGERATION 5:1
0 250
SCALE IN FEET

EXPLANATION

74.11 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 1999

OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION

60 — EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

POTENTIOMETRIC SURFACE

NM — NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT, GRACE

* — ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

NOTE 1: THE SHALLOWEST WELL CONTAINING WATER WAS USED TO PLOT THE POTENTIOMETRIC SURFACE.

2: ELEVATION IN FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM.

3: SEE HSI GEOTRANS REPORT ON GRACE PROPERTY FOR DETAIL ON WATER LEVEL DRAWDOWN DUE TO GRACE PUMPING.

4. G01S, G01D, G01DB USED 5/6/97 SURVEY ELEVATION DATA.

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FIGURE 1E

POTENTIOMETRIC CROSS-SECTION L-L'
MEASURED IN APRIL, 1999

TARGET SHEET

THE MATERIAL DESCRIBED BELOW
WAS NOT SCANNED BECAUSE:

(X) OVERSIZED MAP

() NON-PAPER MEDIA

() OTHER:

DOC ID: 223120
DATE: 11/15/1999
TITLE: REMEDIAL DESIGN / REMEDIAL ACTION (RD/RA) YEAR 7 ANNUAL REPORT FOR THE UNIFIRST SITE, GROUNDWATER EXTRACTION, TREATMENT, MONITORING AND CAPTURE SYSTEM PERFORMANCE
DESCRIPTION: FIGURE 1F: POTENTIOMETRIC CROSS-SECTION P-P' AT VERTICAL EXAGGERATION OF 5:1 MEASURED IN APRIL, 1999

THE OMITTED MATERIAL IS AVAILABLE FOR REVIEW
BY APPOINTMENT
AT THE EPA NEW ENGLAND SUPERFUND RECORDS CENTER,
BOSTON, MA

TARGET SHEET

THE MATERIAL DESCRIBED BELOW
WAS NOT SCANNED BECAUSE:

(X) OVERSIZED MAP

() NON-PAPER MEDIA

() OTHER:

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DESCRIPTION: FIGURE 3: ESTIMATED MAXIMUM EXTENT OF CAPTURE IN BEDROCK PROJECTED FROM ESTIMATED POTENTIOMETRIC CROSS-SECTIONS IN APRIL, 1999 OF THE NORTHEAST QUADRANT

THE OMITTED MATERIAL IS AVAILABLE FOR REVIEW
BY APPOINTMENT
AT THE EPA NEW ENGLAND SUPERFUND RECORDS CENTER,
BOSTON, MA

TARGET SHEET

THE MATERIAL DESCRIBED BELOW
WAS NOT SCANNED BECAUSE:

(X) OVERSIZED MAP

() NON-PAPER MEDIA

() OTHER:

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DESCRIPTION: FIGURE 4: PRE & POST PUMPING VOC DATA FOR ALL REGULARLY MONITORED WELLS

THE OMITTED MATERIAL IS AVAILABLE FOR REVIEW
BY APPOINTMENT
AT THE EPA NEW ENGLAND SUPERFUND RECORDS CENTER,
BOSTON, MA

Appendix B

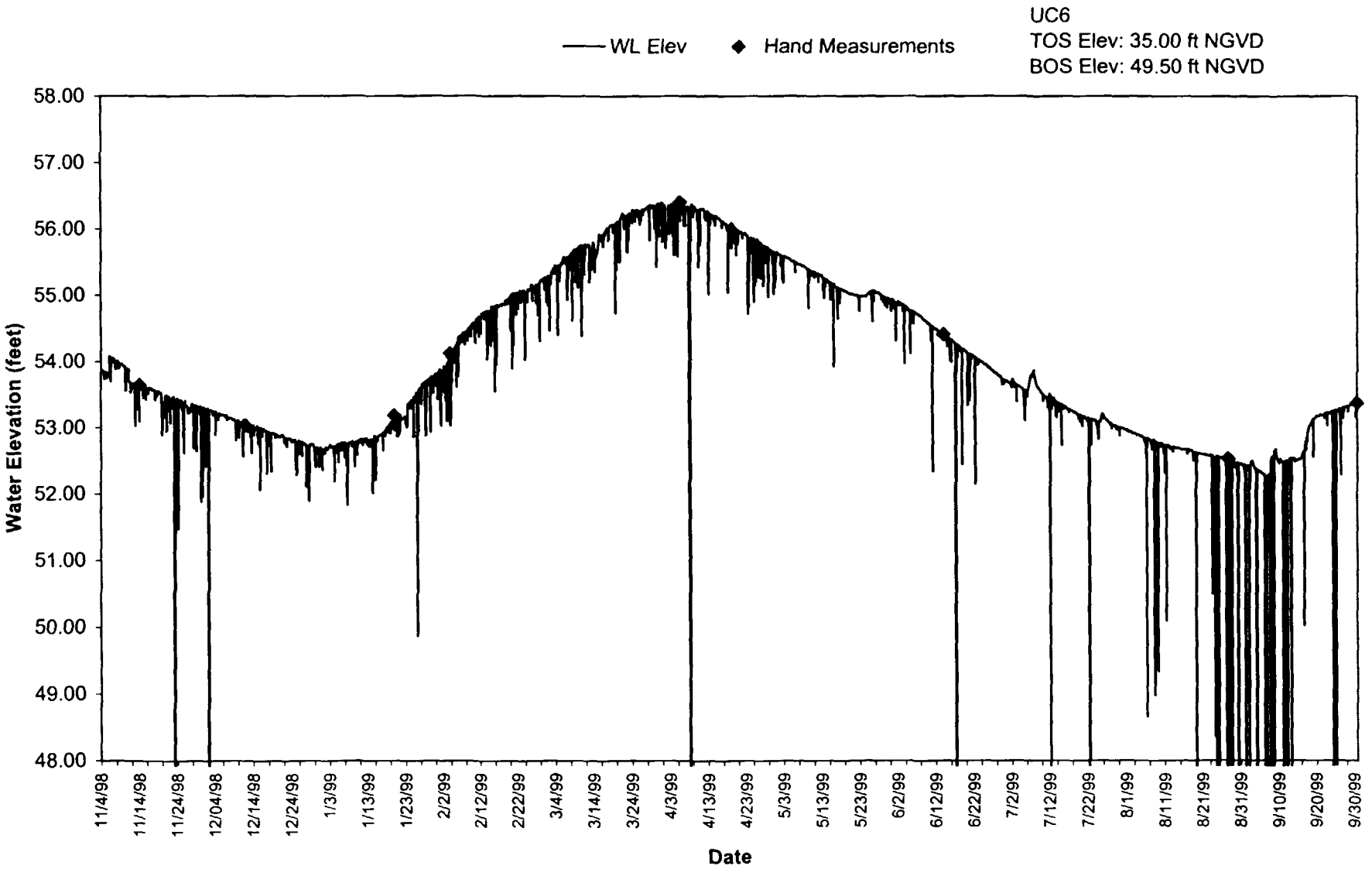
1999 Groundwater Elevation Data

Appendix C

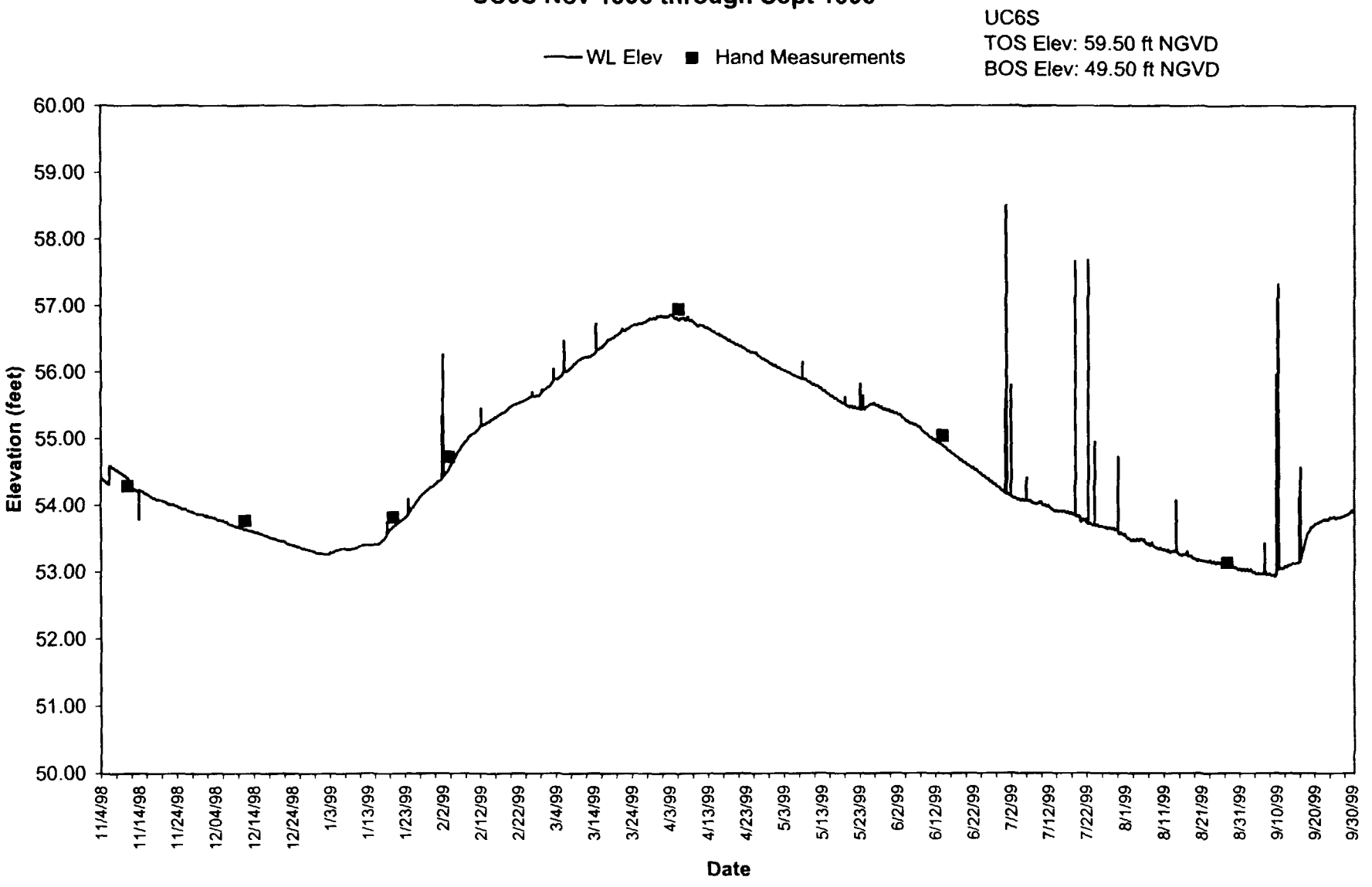
Data Logger Hydrographs

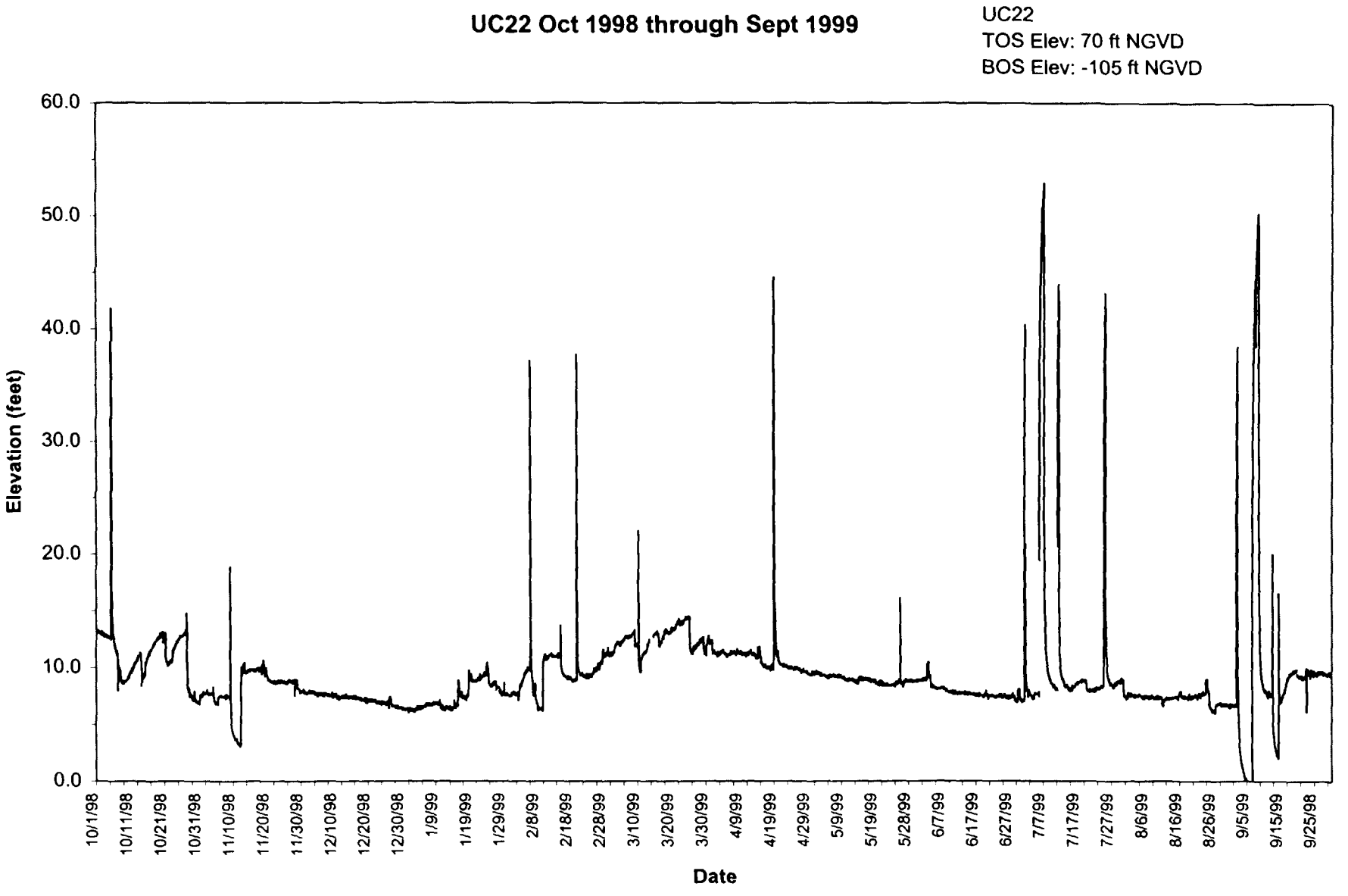
November 1998 – September 1999

UC6 Nov 1998 through Sept 1999



UC6S Nov 1998 through Sept 1999




UC22 Oct 1998 through Sept 1999
UC22
TOS Elev: 70 ft NGVD
BOS Elev: -105 ft NGVD
Elevation (feet)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
10/1/98
10/11/98
10/21/98
10/31/98
11/10/98
11/20/98
11/30/98
12/10/98
12/20/98
12/30/98
1/9/99
1/19/99
1/29/99
2/8/99
2/18/99
2/28/99
3/10/99
3/20/99
3/30/99
4/9/99
4/19/99
4/29/99
5/9/99
5/19/99
5/28/99
6/7/99
6/17/99
6/27/99
7/7/99
7/17/99
7/27/99
8/6/99
8/16/99
8/26/99
9/5/99
9/15/99
9/25/98
Date

Appendix D

April 1999 Groundwater Quality Data

Appendix E

Annual Inspection Report

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/8/99
Sample GO1DB

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	0.9 J	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	24	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	2	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample S70D

Acetone	5	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	3	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	U(1)	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/8/99
Sample S71D

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	82	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	2	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	0.7 J	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample S71S

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	180	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	1	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	1	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/6/99
Sample S81D

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	0.9 J	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	140 J	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	3	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	3	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/6/99
Sample S81M

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	0.8 J	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	1	µg/L
Cis-1,2-dichloroethylene	2 J	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	140	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	8	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	3	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/6/99
Sample S81S

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	1	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	18	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	6	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	U(1)	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10-1

Acetone	4 J	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	1	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	2	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	0.6 J	µg/L
Cis-1,2-dichloroethylene	530	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	400	µg/L
Toluene	49	µg/L
1,1,1-Trichloroethane	1	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	88	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10-2

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	3 J	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	1	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	0.6 J	µg/L
Cis-1,2-dichloroethylene	150	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	130	µg/L
Toluene	35	µg/L
1,1,1-Trichloroethane	1 J	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	51	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	0.6 J	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10-3

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	0.5 J	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	2	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	0.9 J	µg/L
Cis-1,2-dichloroethylene	510	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	68	µg/L
Toluene	31	µg/L
1,1,1-Trichloroethane	0.9 J	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	29	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10-4

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	71	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	130	µg/L
Toluene	30	µg/L
1,1,1-Trichloroethane	0.9 J	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	33	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10-5

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	0.6 J	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	98	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	84	µg/L
Toluene	22	µg/L
1,1,1-Trichloroethane	0.6 J	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	22	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10-6

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	49	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	37	µg/L
Toluene	6	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	10	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10D

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	U(1)	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	U(1)	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10M

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	U(1)	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	U(1)	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/7/99
Sample UC10S

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	U(1)	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	U(1)	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC11-2

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	1	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	0.5 J	µg/L
Cis-1,2-dichloroethylene	2	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	170	µg/L
Toluene	7	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	100	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC6

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	34	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	3	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/8/99
Sample UC6S

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	U(1)	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	5	µg/L
Toluene	U(1)	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	U(1)	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC7-1

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	1	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	5	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	4	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	3	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	2900	µg/L
Toluene	47	µg/L
1,1,1-Trichloroethane	21	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	64	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC7-2

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	32	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	11	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	11	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	5100	µg/L
Toluene	30	µg/L
1,1,1-Trichloroethane	150	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	71	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC7-3

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	5	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	5	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	5	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	2000	µg/L
Toluene	17	µg/L
1,1,1-Trichloroethane	28	µg/L
1,1,2-Trichloroethane	42	µg/L
Trichloroethylene	37	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC7-4

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	4	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	3	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	3	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	1300	µg/L
Toluene	9	µg/L
1,1,1-Trichloroethane	24	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	42	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/9/99
Sample UC7-5

Acetone	U(5)	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	U(5)	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	1	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	U(2)	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	210	µg/L
Toluene	11	µg/L
1,1,1-Trichloroethane	1	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	23	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	U(1)	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/8/99
Sample UG1-4

Acetone	19	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	51	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	0.6 J	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	2	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	0.6 J	µg/L
Toluene	1	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	18	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	0.9 J	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Water Quality Summary Report
Wells G&H Site, April 1999

Sample Date: 4/8/99
Sample UG1-4

Acetone	19	µg/L
Benzene	U(1)	µg/L
Bromoform	U(1)	µg/L
Bromomethane	U(2)	µg/L
2-Butanone	51	µg/L
Carbon disulfide	U(1)	µg/L
Carbon tetrachloride	U(1)	µg/L
Chlorobenzene	U(1)	µg/L
Dibromochloromethane	U(1)	µg/L
Chloroethane	U(2)	µg/L
Chloroform	U(1)	µg/L
Chloromethane	U(2)	µg/L
Bromodichloromethane	U(1)	µg/L
1,1-Dichloroethane	0.6 J	µg/L
1,2-Dichloroethane	U(1)	µg/L
1,1-Dichloroethylene	U(1)	µg/L
Cis-1,2-dichloroethylene	2	µg/L
Trans-1,2-dichloroethylene	U(2)	µg/L
1,2-Dichloropropane	U(1)	µg/L
Cis-1,3-Dichloropropylene	U(1)	µg/L
Trans-1,3-Dichloropropylene	U(1)	µg/L
Ethylbenzene	U(1)	µg/L
2-Hexanone	U(4)	µg/L
Methylene chloride	U(1)	µg/L
4-Methyl-2-Pentanone	U(3)	µg/L
Styrene	U(1)	µg/L
1,1,2,2-Tetrachloroethane	U(1)	µg/L
Tetrachloroethylene	0.6 J	µg/L
Toluene	1	µg/L
1,1,1-Trichloroethane	U(1)	µg/L
1,1,2-Trichloroethane	U(1)	µg/L
Trichloroethylene	18	µg/L
Vinyl chloride	U(2)	µg/L
Xylene (total)	0.9 J	µg/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

UNIFIRST TREATMENT SYSTEM
ANNUAL PLANNED MAINTENANCE CHECKLIST

1. Diaphragm Check Valve

Manufactured by CLA-VAL CO. Model 81-01, 2"- Angle style

Inspect the diaphragm, disc and seat O-ring carefully for signs of wear, corrosion or other abnormal condition (refer to manufacturers literature). Replace these parts unless the inspection indicates they are free of wear or any other abnormal condition.

DATE INSPECTED 9/8/99

INSPECTOR Bryan McCoy

MASS. PLUMBER'S LICENSE # 10364

PARTS REPLACED

a) Diaphragm	(yes)	no
b) Disc	(yes)	no
c) Seat O-ring	(yes)	no

2. Pressure Reducing Valve

Manufactured by WATTS REGULATOR, Model 223LP, 1½"

Inspect the diaphragm, seat, disc and gaskets carefully for signs of wear, corrosion or other abnormal condition (refer to manufacturers literature). Replace these parts unless the inspection indicates they are free of wear or any other abnormal condition.

DATE INSPECTED 9/8/99

INSPECTOR Bryan McCoy

MASS. PLUMBER'S LICENSE # 10364

PARTS REPLACED

a) Diaphragm	(yes)	no
b) Disc	(yes)	no
c) Seat	yes	(no)
d) Seat Gasket	yes	(no)
e) Bottom Plug Gasket	(yes)	no
f) Disc Screw	yes	(no)

NOTE: IF ADDITIONAL MAINTENANCE ACTIVITIES ARE PERFORMED LIST THEM ON A SEPARATE SHEET OF PAPER AND INCLUDE THE FOLLOWING INFORMATION;

Date, component, description of problem, description of maintenance performed and remedial recommendations (if appropriate).

UNIFIRST TREATMENT SYSTEM
ANNUAL SYSTEM INSPECTION CHECKLIST

INSPECTOR: RE/TC DATE: 9/8/99

I WELL HEAD @ UC 22

Condition of well cap Good
Signs of wear or abuse NO

Condition of pressure transducer junction box Good
Condition of desiccant _____ (replace if indicator is pink)

Remove any debris that may have collected around well head.

II INFLUENT PIPE CORRIDOR

Evidence of settlement NO
Evidence of leakage NO

III DISCHARGE PIPE CORRIDOR

Evidence of settlement NO
Evidence of leakage NO

Open and inspect the two cleanouts located at 90° bends on discharge line.
Remove valve box cover and 4" PVC threaded plug.

Condition of 1st cleanout (outside treatment room) _____
Condition of 2nd cleanout (@ NW corner of site) _____

IV DISCHARGE OUTFALL AT THE ABERJONA RIVER

Conditions at the outfall Discharge Pipe NOT visible

V TREATMENT SYSTEM PIPING AND VALVING

Inspect all piping, fittings and valving for leakage and signs of stress. With the treatment system off, exercise all valves through their complete range of operation and restore to their original position. Complete the following table to assure every valve is exercised. Indicate the sequence of operation, i.e. Found Open - Closed - Left Open (OCO) or Found Closed - Opened - Left Closed (COC). Inspect and indicate the condition of each valve tag, replace as needed and so note on the table.

UNIFIRST TREATMENT SYSTEM
ANNUAL SYSTEM INSPECTION CHECKLIST

ANNUAL VALVE INSPECTION AND EXERCISING TABLE

VALVE	EXERCISE SEQUENCE (OCO or COC)	I.D. TAG CONDITION	VALVE	EXERCISE SEQUENCE (OCO or COC)	I.D. TAG CONDITION
B1			B26	COC	OK
B2	OCO	O.K	B101	OCO	OK
B3	OCO	OK	B102	—	—
B4	OCO	OK	B106	COC	OK
B5	OCO	OK	B222	—	—
B6	COC	OK	B333	—	—
B7	COC	OK	B444	COC	OK
B8	OCO	OK	B555	COC	OK
B9	OCO	OK	G-1	OCO	OK
B10	COC	OK	G-2	COC	OK
B11	COC	OK	G-3	COC	OK
B12	COC	OK	G-6	COC	OK
B13	OCO	OK	G-7	OCO	OK
B14	COC	OK	F1	OCO	OK
B15	COC	OK	F2	COC	OK
B16	OCO	OK	F3	COC	OK
B17	COC	OK	F4	COC	OK
B18	OCO	OK	F5	COC	OK
B19	COC	OK	B27	COC	OK
B20	COC	OK	B27A	COC	OK
B21	COC	OK			
B22	COC	OK			
B23	OCO	OK			
B24	COC	OK			
B25	COC	OK			

UNIFIRST TREATMENT SYSTEM
ANNUAL SYSTEM INSPECTION CHECKLIST

VI TREATMENT SYSTEM TANKAGE

Visually inspect the tankage associated with the treatment system. This includes; the multi-media filter; the carbon tanks; the backwash settling tank; and the discharge tank. Inspect the tanks for general condition; at every weld or seam; and at each pipe connection. The clamps at either end of the carbon hoses must be checked and tightened if necessary.

Multi-Media Filter

General condition Good
Condition of welds Good
Condition at pipe penetrations Good

Cartridge Filter

General Condition Good
Condition of Welds Good

Carbon Tanks

General condition Surface Rust
Condition of welds Good
Condition at pipe penetrations Fair
Condition of carbon hoses and hose clamps Fair
(check the tension of the clamps, tighten as needed)

Backwash Settling Tank

General condition Good
Condition at pipe penetration Good

Discharge Tank

General condition Good
Condition at pipe penetrations Good

VII BACKWASH MULTI-MEDIA FILTER

Backwash the multi-media filter following the procedure in Section 3.4.1 of the O&M Manual. Backwash to be performed during Annual Inspection, unless previously accomplished during the year of operation.

Backwash performed _____ Duration(minutes) _____

UNIFIRST TREATMENT SYSTEM
ANNUAL SYSTEM INSPECTION CHECKLIST

VIII CARTRIDGE FILTER

Open and remove the filter element.
Clean the filter element as per the manufacturer's recommendations.
Collect the rinsate in a drum designated for this purpose.

IX FLOOR SUMP PUMP (P7)

Inspect and test the floor sump pump.
General condition Good
Pump operation Good
Clean suction screen on bottom of pump.

X HYDROGEN PEROXIDE CONTAINMENT STRUCTURE

Inspect the containment structure and lining. Remove any debris that may have accumulated

General condition Good
Liner condition Good

XI FLOOR TO WALL SEAL AND CONTAINMENT CURBS

Inspect the condition of the floor to wall seal along the south and west walls of the treatment room. Check the seal for tears, abrasions and continuity with the walls and floor. Inspect the containment curbing at the doors to the treatment room and those adjacent to the discharge tank. Check to assure the curbing is bonded to the concrete slab substratum.

Floor to water seal - general condition Good

Containment curbs - general condition Good

XII EMERGENCY EYEWASH/SHOWER

Test and inspect the emergency eyewash and shower.

Eyewash - tested yes general condition good

Shower - tested yes general condition good

UNIFIRST TREATMENT SYSTEM
ANNUAL SYSTEM INSPECTION CHECKLIST

XIII PRESSURE RELIEF VALVE AND FLOW SWITCH

Test and inspect the pressure relief valve (system must be operating) and the flow switch.

Test pressure relief valve and note response:

Well pump (P1) shut down
Annunciator #2 yes
Dial out routine yes

Relief valve and flow switch - general condition good

XIV HIGH LEVEL ELECTRODES - BACKWASH SETTLING TANK AND FLOOR SUMP

Test and inspect the high level electrode assemblies for the backwash settling tank and floor sump.

Disconnect modem telephone line to avoid repetitive call outs -- or advise the answering service of testing being performed.

Simulate a high level condition by immersing the sensors in the same container of water. Test the level sensors with the well pump operating and note the responses.

Backwash settling tank

Test high level electrodes and note response:

Well pump (P1) shut off
Annunciator #1 yes

General condition of electrode assembly Good

Floor Sump

Test high level electrodes and note response:

Well pump (P1) shut off
Annunciator #2 yes

General condition of electrode assembly Good

NOTE: Remember to re-connect modem telephone line.

UNIFIRST TREATMENT SYSTEM
ANNUAL SYSTEM INSPECTION CHECKLIST

XV VENTILATION SYSTEM

Test the operation of and inspect the vent fan and make-up louvers. The fan operates by the switch just inside the exterior access door of the treatment plant.

Vent fan

Test operation OK general condition good

Make-up air louvers

Test operation OK general condition good

XVI DATA LOGGER

Open the data logger enclosure and carefully remove the desiccant and place the same amount of fresh desiccant in the same location within the enclosure.

XVII RECOMMENDATIONS

Record below any recommendations to the treatment system operation or maintenance. Indicate the rationale for the recommendations.

Carbon by-pass ball valve needs To
be Replaced (B-14) - Leaking

Backflush pump needs To be Re-piped
Small Leak near pump & PVC

Appendix F

Treatment Plant Monitoring Data

Influent (S-1)
UV Effluent (S5UV)
Carbon #1 Effluent (S5C)
Final Effluent (S6 & S7)

Sample Location S1, influent from UC22
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

Method 8260

	Laboratory Results (µg/l)				
Date	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCE**	**PCE**	**TCE**
02-Sep-98	-	-	-	490	28
04-Nov-98	4	-	-	700	30
05-Jan-99	4	-	-	490	31
04-Mar-99	4	-	4	1400	60
04-May-99	5	-	-	800	34
01-Jun-99	4	-	-	510	29
06-Jul-99	4	0.6	4	730	34
14-Sep-99	4 J	-	-	810	35

Sample Location S5UV, effluent from UV Unit
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

Method 601

	Laboratory Results (µg/l)				
Date	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCE**	**PCE**	**TCE**
07-Oct-98	3.4	-	-	-	-
04-Nov-98	3.7	-	-	0.52	-
01-Dec-98	3.3	-	-	-	-
05-Jan-99	3.5	-	-	-	-
07-Feb-99	3.9	12	1.3	12	8.2
04-Mar-99	3.6	-	-	-	-
06-Apr-99	4.5	-	2.5	-	1.2
04-May-99	3.8	12	1.1	14	6.2
01-Jun-99	3.9	-	-	-	-
06-Jul-99	3	7.8	-	1.6	3.2
03-Aug-99	2.8	-	-	-	-
14-Sep-99	4	-	-	-	-
05-Oct-99	3.9	-	-	-	-

Sample Location S5C, effluent from 1st carbon tank
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

Method 601

	Laboratory Results (µg/l)				
Date	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCE**	**PCE**	**TCE**
07-Oct-98	2.9	-	-	1.3	-
04-Nov-98	3.6	-	-	1.6	-
01-Dec-98	3.4	-	-	0.93	-
05-Jan-99	3.6	-	-	0.94	-
07-Feb-99	-	-	-	-	-
04-Mar-99	-	-	-	-	-
06-Apr-99	-	-	-	-	-
04-May-99	-	-	-	-	-
01-Jun-99	1.3	-	-	-	-
06-Jul-99	2.6	-	-	-	-
03-Aug-99	2.8	-	0.5	0.3	-
14-Sep-99	3.4	-	-	-	-
05-Oct-99	3.7	-	-	-	-

Sample Location S6, final effluent
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

EPA Method 524.2

	Laboratory Results (µg/l)					
Date	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCE**	**PCE**	**TCE**	**Lead**
Limit	**None**	**7**	**70**	**5**	**5**	**10.2**
07-Oct-98	4	-	-	-	-	-
04-Nov-98	4	-	-	-	-	2.5
01-Dec-98	4	-	-	-	-	1.9
01-Dec-98 S7	4	-	-	-	-	NA
05-Jan-99	4	-	-	-	-	3.7
07-Feb-99	-	-	-	-	-	2.8 B
04-Mar-99	-	-	-	-	-	-
06-Apr-99	0.3	-	-	-	-	2 B
04-May-99	1	-	-	-	-	-
01-Jun-99	3	-	-	-	-	-
01-Jun-99 S7	-	-	-	-	-	NA
06-Jul-99	-	-	-	-	-	-
03-Aug-99	4	-	0.5	0.3	-	<5
14-Sep-99	5	-	0.5	0.4J	0.3J	<5
05-Oct-99	5	-	0.5	0.3J	0.3J	<1

S7 is a duplicate of S6

Water Level Measurements
Wells G & H
April, 1999

Well	Date	Depth to Water (feet)	Water Level Elevation (feet above NGVD)
DP1D	4/7/99	0.52	52.02
DP1S	4/7/99	0.60	51.68
DP2D	4/7/99	3.77	47.78
DP2M	4/7/99	3.97	47.62
DP2S	4/7/99	2.64	49.13
DP3	4/6/99	NM	NM
DP36	4/6/99	2.89	55.89
DP37D	4/6/99	7.62	51.91
DP37S	4/6/99	2.60	56.98
GO1D	4/8/99	NM	NM
GO1DB	4/8/99	35.03	38.02
GO1S	4/8/99	15.65	57.48
IUS1	4/6/99	16.28	71.85
IUS2A	4/6/99	7.35	55.76
IUS2B	4/6/99	6.34	56.24
IUS2C	4/6/99	6.40	56.83
IUS3A	4/6/99	6.12	60.73
IUS3B	4/6/99	7.22	59.85
IUS3C	4/6/99	7.08	59.99
K42D	4/6/99	3.04	52.78
K42M	4/6/99	2.54	53.70
K42S	4/6/99	2.09	53.81
S63D	4/8/99	13.41	56.01
S63S	4/8/99	13.31	56.19
S64D	4/6/99	6.36	53.45
S64M	4/6/99	6.04	53.62
S64S	4/6/99	6.37	53.09
S65DR	4/8/99	25.34	54.55
S65M	4/8/99	21.58	54.86
S65S	4/8/99	21.47	54.95
S66D	4/8/99	15.03	55.14
S67D	4/8/99	19.07	63.98
S67M	4/8/99	16.73	66.30
S67S	4/8/99	14.93	68.13
S69D	4/8/99	18.91	56.59
S70D	4/6/99	14.39	55.44
S70M	4/6/99	10.66	59.25
S70S	4/6/99	12.25	57.21
S71D	4/6/99	11.20	59.92
S71S	4/6/99	10.76	60.56
S7R	4/8/99	6.35	89.42
S81D	4/7/99	7.04	48.90
S81M	4/7/99	6.54	50.84
S81S	4/7/99	4.27	51.67
S82	4/6/99	9.76	48.70
S97D	4/6/99	5.84	45.02
S97M	4/6/99	6.56	44.85

Well	Date	Depth to Water (feet)	Water Level Elevation (feet above NGVD)
S97S	4/6/99	7.13	44.91
UC10-1	4/8/99	30.18	39.42
UC10-2	4/8/99	3.50	66.10
UC10-3	4/8/99	NM	NM
UC10-4	4/8/99	23.82	45.78
UC10-5	4/8/99	NM	NM
UC10-6	4/8/99	NM	NM
UC10D	4/6/99	12.25	57.18
UC10M	4/6/99	11.12	58.50
UC10S	4/6/99	10.79	58.69
UC11-1	4/8/99	NM	NM
UC11-2	4/8/99	23.60	46.60
UC11-3	4/8/99	NM	NM
UC11-4	4/8/99	NM	NM
UC11-5	4/8/99	NM	NM
UC11-6	4/8/99	6.70	63.50
UC12-1	4/8/99	38.70	36.10
UC12-2	4/8/99	43.90	30.90
UC12-3	4/8/99	NM	NM
UC12-4	4/8/99	NM	NM
UC12-5	4/8/99	37.70	37.10
UC12-6	4/8/99	26.20	48.60
UC15D	4/6/99	35.25	34.95
UC15S	4/6/99	20.51	50.14
UC16	4/6/99	10.22	62.27
UC17	4/6/99	6.82	66.46
UC18	4/6/99	20.30	52.65
UC19	4/6/99	17.58	53.07
UC19S	4/6/99	9.82	60.95
UC20	4/6/99	19.57	53.30
UC22	4/6/99	74.53	11.00
UC23-1	4/6/99	57.91	31.98
UC23-2	4/6/99	55.19	34.70
UC23-3	4/6/99	92.18	-2.29
UC23-4	4/6/99	59.29	30.60
UC23-5	4/6/99	58.88	31.01
UC24D	4/6/99	13.48	56.22
UC24S	4/6/99	12.67	57.10
UC25	4/6/99	10.96	60.77
UC26D	4/6/99	11.29	57.59
UC26S	4/6/99	10.06	58.80
UC29D	4/6/99	10.10	60.32
UC29S	4/7/99	10.20	60.34
UC30	4/7/99	12.83	60.64
UC31D	4/7/99	13.60	55.43
UC31M	4/7/99	12.18	56.72
UC31S	4/7/99	12.26	56.89
UC34	4/7/99	5.74	68.32
UC35	4/7/99	7.48	66.16
UC36	4/7/99	****	****
UC4	4/6/99	6.14	67.14
UC5	4/6/99	9.37	63.30
UC6	4/6/99	11.72	56.36

Well	Date	Depth to Water (feet)	Water Level Elevation (feet above NGVD)
UC6S	4/6/99	10.44	56.92
UC7A-1	4/6/99	39.95	28.63
UC7A-2	4/6/99	40.32	28.26
UC7A-3	4/6/99	30.35	38.23
UC7A-4	4/6/99	18.26	50.32
UC7A-5	4/6/99	2.78	65.80
UC8	4/7/99	4.52	69.34
UC9-2	4/8/99	NM	NM
UC9-4	4/8/99	NM	NM
UC9-6	4/8/99	NM	NM
UG1-1	4/8/99	NM	NM
UG1-2	4/8/99	29.80	42.34
UG1-3	4/8/99	NM	NM
UG1-4	4/8/99	32.91	39.23
UG1-5	4/8/99	45.00	27.14
UG1-6	4/8/99	NM	NM
UG1-7	4/8/99	37.82	34.32

Notes:

****	Well was dry
*****	Well was flooded
NM	Well was not measured

Appendix G

TCL/TAL Analytical Report

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3
SDG: WP2297
Report Date: 6/3/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 524 2
Date Analyzed: 5/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/13/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
DICHLORODIFLUOROMETHANE	<1	ug/L	1.0	1	1
CHLOROMETHANE	<1	ug/L	1.0	1	1
VINYL CHLORIDE	<1	ug/L	1.0	1	1
BROMOMETHANE	<1	ug/L	1.0	1	1
CHLOROETHANE	<1	ug/L	1.0	1	1
TRICHLOROFLUOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
1,1-DICHLOROETHENE	<0.5	ug/L	1.0	0.5	0.5
METHYLENE CHLORIDE	JB0.4	ug/L	1.0	0.5	0.5
1,2-DICHLOROETHENE-(TRANS)	<0.5	ug/L	1.0	0.5	0.5
1,1-DICHLOROETHANE	0.9	ug/L	1.0	0.5	0.5
1,2-DICHLOROETHENE (CIS)	<0.5	ug/L	1.0	0.5	0.5
2,2-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
CHLOROFORM	1	ug/L	1.0	0.5	0.5
BROMOCHLOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
1,1,1-TRICHLOROETHANE	1	ug/L	1.0	0.5	0.5
1,2-DICHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5
1,1-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
CARBON TETRACHLORIDE	<0.5	ug/L	1.0	0.5	0.5
BENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
TRICHLOROETHENE	<0.5	ug/L	1.0	0.5	0.5
DIBROMOMETHANE	<0.5	ug/L	1.0	0.5	0.5
BROMODICHLOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
CIS-1,3-DICHLOROPROPENE	<0.5	ug/L	1.0	0.5	0.5
TOLUENE	<1	ug/L	1.0	1.0	1.0
TRANS-1,3-DICHLOROPROPENE	<0.5	ug/L	1.0	0.5	0.5
1,1,2-TRICHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5
1,3-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
DIBROMOCHLOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
TETRACHLOROETHENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DIBROMOETHANE	<0.5	ug/L	1.0	0.5	0.5
CHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,1,1,2-TETRACHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5

Report Notes: none

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3
SDG: WP2297
Report Date: 6/3/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 524.2
Date Analyzed: 5/13/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/13/99	JSS	5030	JSS

Compound	Result	Units	DF	Sample PQL	Method PQL
ETHYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
M+P-XYLENE	<1	ug/L	1.0	1.0	1.0
BROMOFORM	<0.5	ug/L	1.0	0.5	0.5
O-XYLENE	<0.5	ug/L	1.0	0.5	0.5
STYRENE	<0.5	ug/L	1.0	0.5	0.5
1,1,2,2-TETRACHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5
1,2,3-TRICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
ISOPROPYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
BROMOBENZENE	<0.5	ug/L	1.0	0.5	0.5
2-CHLOROTOLUENE	<0.5	ug/L	1.0	0.5	0.5
N-PROPYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
4-CHLOROTOLUENE	<0.5	ug/L	1.0	0.5	0.5
1,3,5-TRIMETHYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
TRET-BUTYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2,4-TRICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
SEC-BUTYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,3-DICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
4-ISOPROPYLTOLUENE	<0.5	ug/L	1.0	0.5	0.5
1,4-DICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
N-BUTYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DIBROMO-3-CHLOROPROPAN	<5	ug/L	1.0	5	5
1,2,4-TRIMETHYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
NAPHTHALENE	<1	ug/L	1.0	1.0	1.0
HEXACHLOROBUTADIENE	<0.5	ug/L	1.0	0.5	0.5
1,2,3-TRICHLOROBENZENE	<1	ug/L	1.0	1.0	1.0
4-BROMOFLUOROBENZENE	92	%	1.0		
1,2-DICHLOROBENZENE-D4	72	%	1.0		

Report Notes: B, J

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3
SDG: WP2297
Report Date: 6/22/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 5/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/8/99	DPD	SW3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
PHENOL	<10	ug/L	1.0	10	10
BIS(2-CHLOROETHYL)ETHER	<10	ug/L	1.0	10	10
2-CHLOROPHENOL	<10	ug/L	1.0	10	10
1,3-DICHLOROBENZENE	<10	ug/L	1.0	10	10
1,4-DICHLOROBENZENE	<10	ug/L	1.0	10	10
1,2-DICHLOROBENZENE	<10	ug/L	1.0	10	10
2-METHYLPHENOL	<10	ug/L	1.0	10	10
2,2'-OXYBIS(1-CHLOROPROPANE)	<10	ug/L	1.0	10	10
4-METHYLPHENOL	<10	ug/L	1.0	10	10
N-NITROSO-DI-N-PROPYLAMINE	<10	ug/L	1.0	10	10
HEXACHLOROETHANE	<10	ug/L	1.0	10	10
NITROBENZENE	<10	ug/L	1.0	10	10
ISOPHORONE	<10	ug/L	1.0	10	10
2-NITROPHENOL	<10	ug/L	1.0	10	10
2,4-DIMETHYLPHENOL	<10	ug/L	1.0	10	10
BIS(2-CHLOROETHOXY)METHANE	<10	ug/L	1.0	10	10
2,4-DICHLOROPHENOL	<10	ug/L	1.0	10	10
1,2,4-TRICHLOROBENZENE	<10	ug/L	1.0	10	10
NAPHTHALENE	<10	ug/L	1.0	10	10
4-CHLOROANILINE	<10	ug/L	1.0	10	10
HEXACHLOROBUTADIENE	<10	ug/L	1.0	10	10
4-CHLORO-3-METHYLPHENOL	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
HEXACHLOROCYCLOPENTADIEN	<10	ug/L	1.0	10	10
2,4,6-TRICHLOROPHENOL	<10	ug/L	1.0	10	10
2,4,5-TRICHLOROPHENOL	<25	ug/L	1.0	25	25
2-CHLORONAPHTHALENE	<10	ug/L	1.0	10	10
2-NITROANILINE	<25	ug/L	1.0	25	25
DIMETHYL PHTHALATE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
2,6-DINITROTOLUENE	<10	ug/L	1.0	10	10
3-NITROANILINE	<25	ug/L	1.0	25	25
ACENAPHTHENE	<10	ug/L	1.0	10	10

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3
SDG: WP2297
Report Date: 6/22/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 5/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/8/99	DPD	SW3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
2,4-DINITROPHENOL	<25	ug/L	1.0	25	25
4-NITROPHENOL	<25	ug/L	1.0	25	25
DIBENZOFURAN	<10	ug/L	1.0	10	10
2,4-DINITROTOLUENE	<10	ug/L	1.0	10	10
DIETHYLPHTHALATE	<10	ug/L	1.0	10	10
4-CHLOROPHENYL-PHENYLETHE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
4-NITROANILINE	<25	ug/L	1.0	25	25
4,6-DINITRO-2-METHYLPHENOL	<25	ug/L	1.0	25	25
N-NITROSODIPHENYLAMINE	<10	ug/L	1.0	10	10
4-BROMOPHENYL-PHENYLETHER	<10	ug/L	1.0	10	10
HEXACHLOROBENZENE	<10	ug/L	1.0	10	10
PENTACHLOROPHENOL	<25	ug/L	1.0	25	25
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
CARBAZOLE	<10	ug/L	1.0	10	10
DI-N-BUTYLPHTHALATE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BUTYLBENZYLPHTHALATE	<10	ug/L	1.0	10	10
3,3'-DICHLOROBENZIDINE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BIS(2-ETHYLHEXYL)PHTHALATE	<10	ug/L	1.0	10	10
DI-N-OCTYLPHTHALATE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
2-FLUOROPHENOL	49	%	1.0		
PHENOL-D6	26	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3
SDG: WP2297
Report Date: 6/22/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 5/26/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/8/99	DPD	SW3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NITROBENZENE-D5	79	%	1.0		
2-FLUOROBIPHENYL	72	%	1.0		
2,4,6-TRIBROMOPHENOL	65	%	1.0		
TERPHENYL-D14	74	%	1.0		

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3RE
SDG: WP2297
Report Date: 6/22/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 6/14/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/14/99	DPD	SW3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
PHENOL	<11	ug/L	1.1	11	10
BIS(2-CHLOROETHYL)ETHER	<11	ug/L	1.1	11	10
2-CHLOROPHENOL	<11	ug/L	1.1	11	10
1,3-DICHLOROBENZENE	<11	ug/L	1.1	11	10
1,4-DICHLOROBENZENE	<11	ug/L	1.1	11	10
1,2-DICHLOROBENZENE	<11	ug/L	1.1	11	10
2-METHYLPHENOL	<11	ug/L	1.1	11	10
2,2'-OXYBIS(1-CHLOROPROPANE)	<11	ug/L	1.1	11	10
4-METHYLPHENOL	<11	ug/L	1.1	11	10
N-NITROSO-DI-N-PROPYLAMINE	<11	ug/L	1.1	11	10
HEXACHLOROETHANE	<11	ug/L	1.1	11	10
NITROBENZENE	<11	ug/L	1.1	11	10
ISOPHORONE	<11	ug/L	1.1	11	10
2-NITROPHENOL	<11	ug/L	1.1	11	10
2,4-DIMETHYLPHENOL	<11	ug/L	1.1	11	10
BIS(2-CHLOROETHOXY)METHANE	<11	ug/L	1.1	11	10
2,4-DICHLOROPHENOL	<11	ug/L	1.1	11	10
1,2,4-TRICHLOROBENZENE	<11	ug/L	1.1	11	10
NAPHTHALENE	<11	ug/L	1.1	11	10
4-CHLOROANILINE	<11	ug/L	1.1	11	10
HEXACHLOROBUTADIENE	<11	ug/L	1.1	11	10
4-CHLORO-3-METHYLPHENOL	<11	ug/L	1.1	11	10
2-METHYLNAPHTHALENE	<11	ug/L	1.1	11	10
HEXACHLOROCYCLOPENTADIEN	<11	ug/L	1.1	11	10
2,4,6-TRICHLOROPHENOL	<11	ug/L	1.1	11	10
2,4,5-TRICHLOROPHENOL	<28	ug/L	1.1	28	25
2-CHLORONAPHTHALENE	<11	ug/L	1.1	11	10
2-NITROANILINE	<28	ug/L	1.1	28	25
DIMETHYL PHTHALATE	<11	ug/L	1.1	11	10
ACENAPHTHYLENE	<11	ug/L	1.1	11	10
2,6-DINITROTOLUENE	<11	ug/L	1.1	11	10
3-NITROANILINE	<28	ug/L	1.1	28	25
ACENAPHTHENE	<11	ug/L	1.1	11	10

Report Notes: A-1, O-6

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3RE
SDG: WP2297
Report Date: 6/22/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 6/14/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/14/99	DPD	SW3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
2,4-DINITROPHENOL	<28	ug/L	1.1	28	25
4-NITROPHENOL	<28	ug/L	1.1	28	25
DIBENZOFURAN	<11	ug/L	1.1	11	10
2,4-DINITROTOLUENE	<11	ug/L	1.1	11	10
DIETHYLPHTHALATE	<11	ug/L	1.1	11	10
4-CHLOROPHENYL-PHENYLETHE	<11	ug/L	1.1	11	10
FLUORENE	<11	ug/L	1.1	11	10
4-NITROANILINE	<28	ug/L	1.1	28	25
4,6-DINITRO-2-METHYLPHENOL	<28	ug/L	1.1	28	25
N-NITROSODIPHENYLAMINE	<11	ug/L	1.1	11	10
4-BROMOPHENYL-PHENYLETHER	<11	ug/L	1.1	11	10
HEXACHLOROBENZENE	<11	ug/L	1.1	11	10
PENTACHLOROPHENOL	<28	ug/L	1.1	28	25
PHENANTHRENE	<11	ug/L	1.1	11	10
ANTHRACENE	<11	ug/L	1.1	11	10
CARBAZOLE	<11	ug/L	1.1	11	10
DI-N-BUTYLPHTHALATE	<11	ug/L	1.1	11	10
FLUORANTHENE	<11	ug/L	1.1	11	10
PYRENE	<11	ug/L	1.1	11	10
BUTYLBENZYLPHTHALATE	<11	ug/L	1.1	11	10
3,3'-DICHLOROBENZIDINE	<11	ug/L	1.1	11	10
BENZO[A]ANTHRACENE	<11	ug/L	1.1	11	10
CHRYSENE	<11	ug/L	1.1	11	10
BIS(2-ETHYLHEXYL)PHTHALATE	<11	ug/L	1.1	11	10
DI-N-OCTYLPHTHALATE	<11	ug/L	1.1	11	10
BENZO[B]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[K]FLUORANTHENE	<11	ug/L	1.1	11	10
BENZO[A]PYRENE	<11	ug/L	1.1	11	10
INDENO[1,2,3-CD]PYRENE	<11	ug/L	1.1	11	10
DIBENZ[A,H]ANTHRACENE	<11	ug/L	1.1	11	10
BENZO[G,H,I]PERYLENE	<11	ug/L	1.1	11	10
2-FLUOROPHENOL	71	%	1.1		
PHENOL-D6	35	%	1.1		

Report Notes: A-1, O-6

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WP2297-3RE
SDG: WP2297
Report Date: 6/22/99
PO No. : 05.05.99
Project: WOBURN GW TREATMENT
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 6/14/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/4/99	5/5/99	5/14/99	DPD	SW3510	SW

Compound	Result	Units	DF	Sample PQL	Method PQL
NITROBENZENE-D5	92	%	1.1		
2-FLUOROBIPHENYL	75	%	1.1		
2,4,6-TRIBROMOPHENOL	83	%	1.1		
TERPHENYL-D14	108	%	1.1		

Report Notes: A-1, O-6

Katahdin
ANALYTICAL SERVICES

CLIENT: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD
WILMINGTON, MA 01887

Lab Number : WP-2297-3
Report Date: 06/23/99
PO No. : 05.05.99
Project : WOBURN GW TREATMENT SYSTEM

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
S6	Aqueous	CLIENT	05/04/99	05/05/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
TCL Pest/PCB 8081								
alpha-BHC	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
gamma-BHC (Lindane)	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
Heptachlor	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
Aldrin	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
beta-BHC	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
delta-BHC	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
Heptachlor epoxide	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
Endosulfan I	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
gamma-Chlordane	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
alpha-Chlordane	<0.06	µg/L	1.1	0.05	EPA 8081	05/26/99	JY	
4,4'-DDE	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Dieldrin	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Endrin	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
4,4'-DDD	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Endosulfan II	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 05/11/99 by PMM

06/23/99

LJO/jcbclf/jey/plc(dw)
PE11PPW9
CC: HARVARD PROJECT SERVICES
51 MYRICK LANE
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978-772-1105

Katahdin ANALYTICAL SERVICES

CLIENT: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD
WILMINGTON, MA 01887

Lab Number : WP-2297-3
Report Date: 06/23/99
PO No. : 05.05.99
Project : WOBURN GW TREATMENT SYSTEM

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
S6	Aqueous	CLIENT	05/04/99	05/05/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
4,4'-DDT	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Endrin aldehyde	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Endosulfan sulfate	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Methoxychlor	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
Chlordane	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
Endrin ketone	<0.1	µg/L	1.1	0.1	EPA 8081	05/26/99	JY	
Toxaphene	<1.1	µg/L	1.1	1	EPA 8081	05/26/99	JY	
PCB-1016	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
PCB-1221	<1.1	µg/L	1.1	1	EPA 8081	05/26/99	JY	
PCB-1232	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
PCB-1242	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
PCB-1248	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
PCB-1254	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
PCB-1260	<0.6	µg/L	1.1	0.5	EPA 8081	05/26/99	JY	
2,4,5,6-Tetrachloro-meta-xylene (%	57.	%	1.1		EPA 8081	05/26/99	JY	
Decachlorobiphenyl (% Recovery)	81.	%	1.1		EPA 8081	05/26/99	JY	

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06/23/99

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INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services | Client Field ID: S6

Matrix: WATER | SDG Name: WP2297

Percent Solids: 0.00 | Lab Sample ID: WP2297-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	17.9	B		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	2.07	U		P	1
7440-39-3	BARIUM	14.4			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	109000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	38.0	B		P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	13000			P	1
7439-96-5	MANGANESE	0.97	U		P	1
7439-97-6	MERCURY	0.02	B		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	2260			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	72700			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	4.0	B		P	1

Color Before: COLORLESS | Clarity Before: CLEAR

Color After: COLORLESS | Clarity After: CLEAR

Comments:

Katahdin
ANALYTICAL SERVICES

CLIENT: BRIAN KEEGAN
UNIFIRST CORPORATION
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Lab Number : WP-2297-3
Report Date: 06/23/99
PO No. : 05.05.99
Project : WOBURN GW TREATMENT SYSTEM

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
S6	Aqueous	CLIENT	05/04/99	05/05/99

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Cyanide, Total	20.	µg/L	1.0	10	335.4	05/12/99	CF	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 05/12/99 by CLF

06/23/99

LJO/baeplc(dw)

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